INSTALLATION AND MAINTENANCE INSTRUCTIONS FOR COMPACT UNIT & COMPACT TOP

Applicable to program version 2.03 and newer versions

COMPACT Unit

COMPACT Top

The document was originally written in Swedish.

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Registered design. The company reserves the right to make design changes without prior notice.

1 GENERAL

1.1 Range of Application

The COMPACT Unit and COMPACT Top are complete air handling units with built-in control equipment. The air handling units are designed for comfort ventilation and can be utilised in smaller buildings such as offices, schools, day nurseries, public buildings, shops and residential buildings.

The COMPACT Unit air handling units have duct connection spigots on their end panels whereas the COMPACT Top units have them at the top. The type of unit can therefore be selected on the basis of the amount of space available for installing it and for arranging the ducts.

The COMPACT Unit and COMPACT Top are one-piece air handling units. If supplementary function sections such as dampers and air coolers are required, they must be installed in the ductwork.

In order to fully obtain all the benefits the COMPACT system has to offer, it is important keep in mind the air handling unit's special characteristics in conjunction with designing the project, installing the unit, adjusting it and operating the system.

The unit must be installed indoors.

Important!

Always read the safety precautions in Section 2 that explain the risks involved in running the unit and designate who shall be permitted to operate and service the unit, and carefully follow the installation instructions provided in each paragraph.

The product identification plate is situated on the top of the air handling unit. Refer to the particulars on the product identification plate when you contact Swegon.

1.2 Mechanical Design

The COMPACT is available in one physical size and for two airflow ranges.

The external sheet metal surfaces of the unit are painted white, NCS S 0502-G, except for the rear of the COMPACT Top unit which consists of an aluminium-zinc plated sheet steel casing panel..

The upper section of the junction hood of the COMPACT Unit is light grey, NCS S3502-B and the lower section is dark grey, NCS S6010-R90B.

The inner skin is predominantly made of aluminium-zinc plated sheet steel. The casing has 30 mm thick intervening mineral wool insulation; the inspection doors have 50 mm thick insulation.

The COMPACT Unit and the COMPACT Top are equipped with pleated, Class F7 filters.

The type RECOnomic rotary heat exchanger is variable speed controlled and has a temperature efficiency of up to 85%.

The supply air and extract air fans are direct-driven plug fans. The fans are equipped with EC motors that provide high efficiency across the entire operating range.

1.3 Control System

The IQnomic control system is microprocessor-based and is integrated into the unit. It controls and regulates the fans, heat exchanger, temperatures, airflows, operating times and a large number of internal and external functions as well as alarms.

1.4 Environmental Documentation

Environmental Documentation with the Dismantling Instructions for Recycling and the Environmental Product Declaration can be downloaded from our website: www.swegon.com.

The air handling unit is designed in such a way that it can be dismantled into its natural parts for scrapping. When the unit has ended its useful product life, the services of an accredited recycling company should be utilised for disposal.

Approximately 94% of the parts in COMPACT air handling units are recyclable.

Swegon AB is associated with the REPA Register, No. 5560778465.

Contact Swegon AB, Phone: +46 (0)512-322 00, if you have any questions regarding the dismantling instructions or the air handling unit's impact on the environment.

1.5 The Components of the Air Handling Units

1.5.1 COMPACT Unit

The individual components each specified below in a simplified and diagrammatical description.

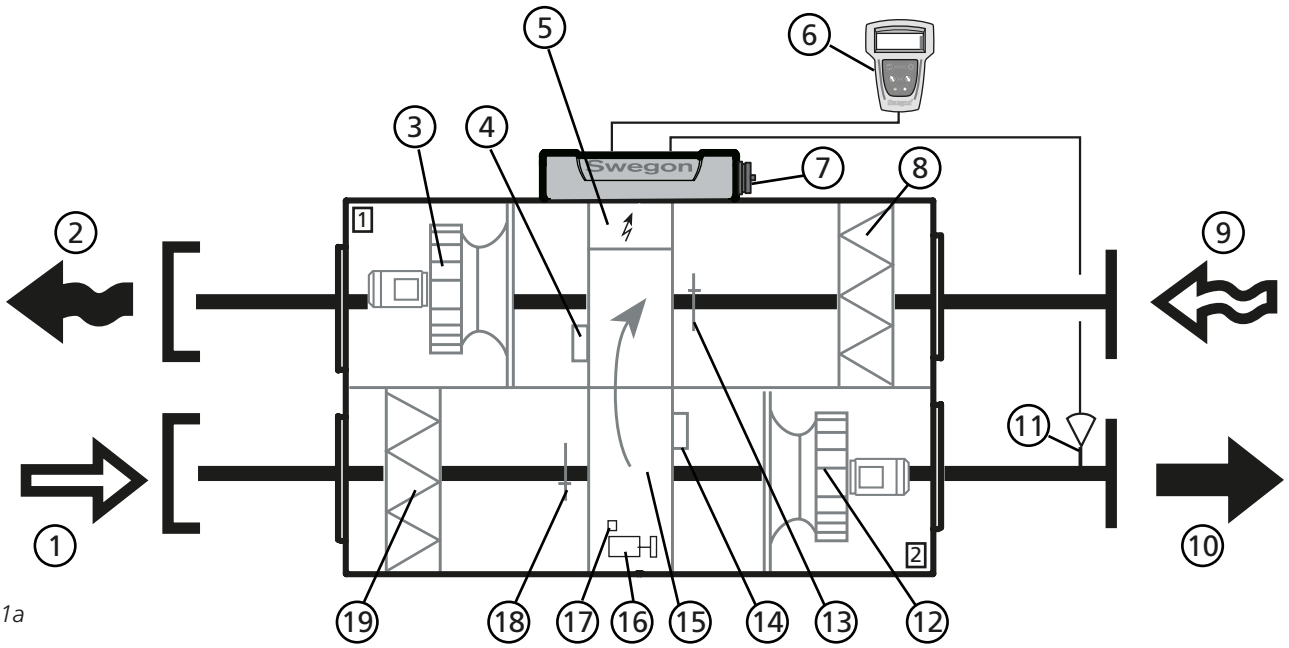
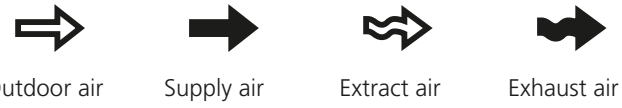


Fig 1a



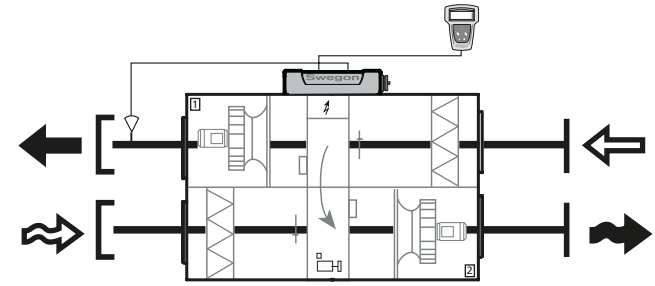


Fig 1b

Left-hand version

The air handling units are supplied in the right-hand version as shown in Fig. 1a.
Coversion to the left-hand version as shown in Fig. can be carried out via a simple adjustment in the control equipment. See 3.4.1.2. The air handling unit can be installed vertically. See 3.4.1.1.
In the left-hand version (Fig. 1b), the components marked with an asterisk change function and designation (the components are named according to whether they are for supply air or extract air).

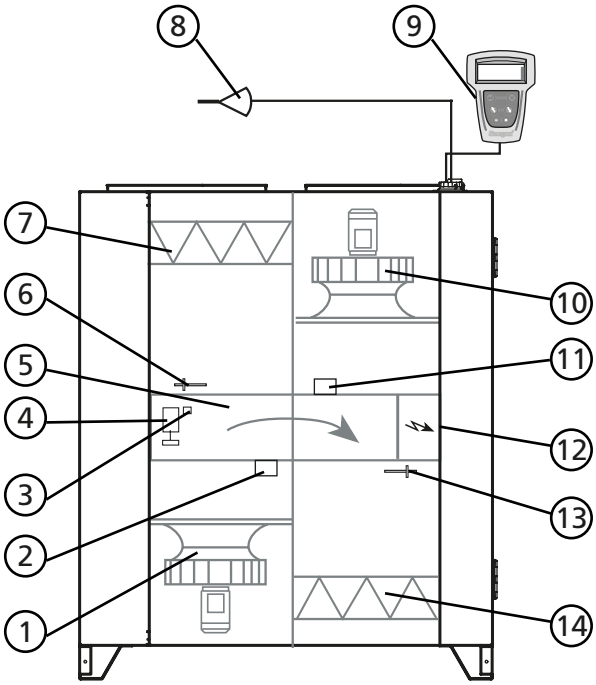
The arrangement of the components and their designations

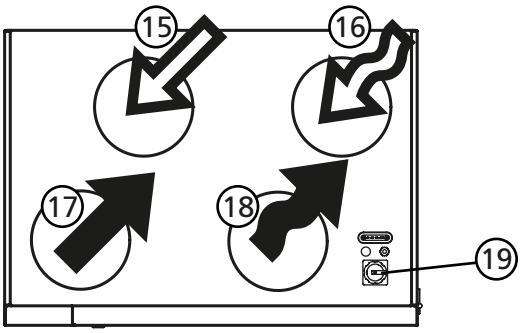
1 OUTDOOR AIR* (Left-hand version: Extract air)
2 EXHAUST AIR* (Left-hand version: Supply air)
3 Extract air fan* with motor and motor control system
4 Pressure sensor, extract air fan*
(Position on function selector switch = 1)
5 Electrical equipm. cubicle with control unit
6 Hand-held micro terminal
7 Main switch/Safety switch
8 Extract air filter*
9 EXTRACT AIR* (Left-hand version: Outdoor air)
10 SUPPLY AIR* (Left-hand version: Exhaust air)
11 Supply air temp. sensor (to be mounted in supply air duct)
12 Supply air fan* with motor and motor control system
13 Extract air temperature sensor*
14 Pressure sensor, supply air fan*
(Position on function selector switch = 2)
15 Heat exchanger
16 Drive motor, heat exchanger
17 Sensor, rotation monitor
18 Outdoor air temperature sensor*
19 Supply air filter*

Registered design. The company reserves the right to make design changes without prior notice.

1.5.2 COMPACT Top

The individual components each specified below in a simplified and diagrammatical description.





View from the above

The arrangement of the components and their designations

1 Supply air fan with motor and motor control system
2 Pressure sensor, supply air fan (Position on function selector switch = 2)
3 Rotation monitor sensor
4 Drive motor, rotary heat exchanger
5 Rotary heat exchanger
6 Sensor, outdoor air temperature
7 Supply air filter
8 Supply air temp. sensor (to be mounted in supply air duct)
9 Hand-held micro terminal
10 Extract air fan with motor and motor control system
11 Pressure sensor, extract air fan (Position on function selector switch = 1)
12 Electrical equipm. cubicle with control unit
13 Sensor, extract air temperature
14 Extract air filter
15 OUTDOOR AIR
16 EXTRACT AIR
17 SUPPLY AIR
18 EXHAUST AIR
19 Main switch/Safety switch

Outdoor air Supply air Extract air Exhaust air

2 SAFETY PRECAUTIONS

All staff concerned must acquaint themselves with these instructions before beginning any work on the unit. Any damages to the unit or parts of it due to improper handling or misuse by the purchaser or the fitter cannot be considered subject to guarantee if these instructions have not been followed correctly.

Warning

Only a qualified electrician or service personnel trained by Swegon shall be permitted to modify the air handling unit in conjunction with electrical installations or the wiring of external functions.

2.1 Safety switch/ Main Switch

On COMPACT Unit, the safety switch is externally positioned on the junction hood.

On the COMPACT Top, the safety switch is positioned on the top front edge of the air handling unit.

The air handling unit must normally be started and stopped from the hand-held micro terminal; not by switching the safety isolating switch on and off.

Always switch off the safety isolating switch before servicing the unit if not otherwise specified in the pertinent instructions.

2.2 Risks

Warning

Before carrying out any work, make sure that the power supply to the air handling unit has been switched off.

Risk areas with moving parts

Typical moving parts are fan impellers and drive pulleys of the rotary heat exchanger.

Inspection doors can only be opened using a special key, they therefore function as safety guards for fans and the heat exchanger. If the ducts are not connected to the fan outlets, the outlets must be fitted with a safety guard (wire mesh screen).

Warning

The inspection doors on the filter/fan sections must not be opened while the unit is in operation.

Under normal operating conditions, use the stop button on the hand-held terminal to stop the air handling unit.

Wait until the fans have stopped rotating before opening the inspection door.

The air pressure inside the filter/fan section is positive, which means that the door can fly open.

2.3 Safety Guards

The lockable inspection door serves as a safety guard for fans/heat exchangers.

The cover over the power supply unit in the electric equipment cubicle serves as a safety guard for this unit.

Only a qualified electrician or trained service technicians shall be allowed to remove the safety guards.

Warning

The power supply to the unit shall be isolated by switching off the safety isolating switch before removing the safety guard.

As long as the air handling unit is operating, the safety guards must always be mounted, all inspection doors must be closed, and the junction hood (COMPACT Unit) on the top of the unit must be mounted.

Registered design. The company reserves the right to make design changes without prior notice.

3 INSTALLATION

3.1 General

The air handling unit is delivered with packaging, standing on a wooden pallet.

Any accessories that have been ordered with the unit are supplied in unmounted condition.

Do not remove the air handling unit's protective plastic foil packaging until you've finished installing it.

3.2 Transport Within the Site

Before removing the transport pallet from the unit, determine whether a forklift truck or a pallet transporter will be used for further transporting the unit to where it is to be placed.

3.3 Parts Packed Together with the Room Units

Components such as the hand-held micro terminal, supply air sensor and document pocket are supplied in separate packaging and delivered together with the air handling unit.

3.3.1 Hand-held Micro Terminal

The hand-held micro terminal is equipped a 3 m long cable and a quick-fit connector. For particulars of the electrical connections, see 20.3.1. A holder for the hand-held micro terminal is supplied together with the air handling unit. The holder can be secured to the outside of the air handling unit or at another appropriate place.

3.3.2 Supply Air Sensor

The sensor is equipped with a 7 m long cable and a quick-fit connector.

For mounting, see 3.6.

3.3.3 Document Pocket

Secure the document pocket to the exterior of the air handling unit or at another appropriate place.

3.4 Location

The air handling unit must be mounted horizontally on a flat and firm supporting surface and this surface must be constructed in a way enabling it to support the weight of the unit.

The design of the COMPACT Unit makes it necessary to mount it on a stand or some other form of base. Otherwise it will not be possible to open the inspection doors. The stand is available as an accessory.

When installing the air handling unit and connecting pipework and electric cables, make sure that adequate free space is provided for opening the inspection doors and covers and withdrawing functional sections, such as filter cassettes and fan assemblies, clear of the unit casing.

Inspection space required

COMPACT Unit: A clear space of 800 mm must be provided in front of the unit for opening the inspection doors and at least 200 mm must be provided above the unit for opening the junction hood.

COMPACT Top: A clear space of 1,000 mm should be provided in front of the unit for opening the inspection door. (right hung).

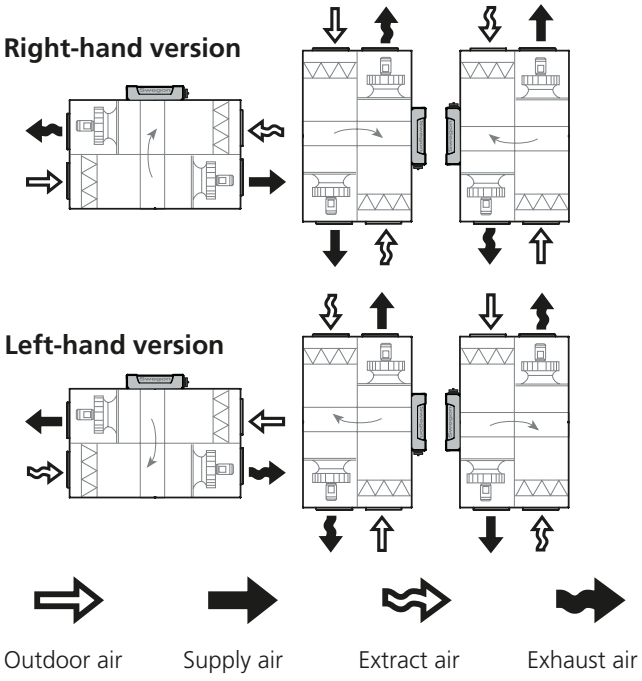
3.4.1 COMPACT Unit

3.4.1.1 Airflow Direction

The COMPACT Units are produced in one single variant where fans, heat exchanger and filters always are arranged at their given physical location inside the unit.

The air handling units are delivered in the right-hand version, but can easily be converted to the left-hand version. See below. All that is needed to be done is to move a DIL switch on the control unit, see 3.4.1.2.

The COMPACT Unit can also be installed vertically. The stand is available as an accessory.



The air handling units are supplied in the right-hand version. The unit can be easily converted to the left-hand version at the building site.

The air handling unit can be installed vertically. This provides six different installation alternatives.

3.4.1.2 Conversion to the Left-hand Version, if required

1. Stop the air handling unit in the hand-held micro terminal. Close the safety isolating switch.
2. Wait until the fans have stopped rotating. Open the inspection doors.
3. Remove the screws that secure the cover plate of the heat exchanger for access to the DIL switch.
4. Set DIL switch No. 1 to the ON position (see 20.3) for the left-hand version (see 3.4.1.1).
5. Refit and secure the cover plate.
6. Rotate the rotary heat exchanger by hand to rotate downwards. This is sufficient tp rotate the rotor approx. one quarter of a revolution.
7. Close the inspection doors.
8. Switch on the safety isolating switch.
9. Start the air handling unit.

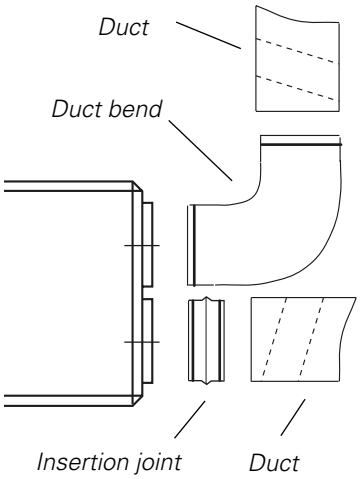
3.5 Connecting ductwork to the Air Handling Unit

The air handling unit's connection spigots are circular and can be connected to ducts by means of insertion joints fitted with a rubber ring seal.

Spiral duct bends fitted with a rubber ring seal can be connected directly without any insertion joint.

The insertion joint/duct bend must be secured by pop rivets or tape in the spigot of the air handling unit.

The ducts should be insulated according to local regulations and customary trade standards.



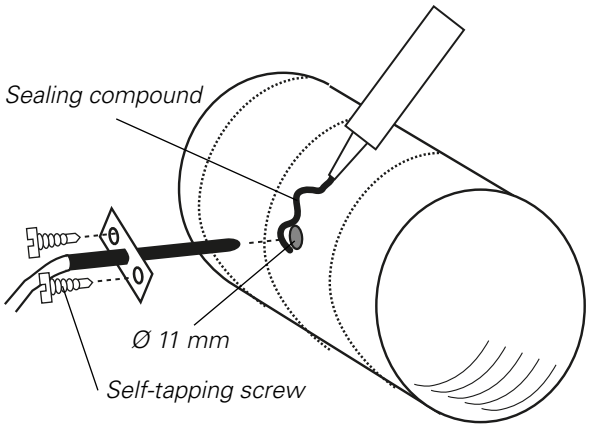
3.6 To Mount the Supply Air Sensor

Supply air temp. sensor must be mounted inside the supply air duct.

The sensor must be positioned at a spot that is at least 1.5 metres from the air handling unit.

Important! If an air heater and/or air cooler, if required, is installed in the system, the sensor must be positioned 1.5 metres from the unit measured from these components.

1. Measure and mark where the sensor is to be placed.
2. Drill an 11 mm dia. hole in the supply air duct.
3. Apply sealing compound around the hole and secure the sensor by means of 2 self-tapping screws.
4. Connect the sensor's quick-fit connector to the socket at the top of the air handling unit, see 20.3.1. An extension cable is available as an accessory.



Registered design. The company reserves the right to make design changes without prior notice.

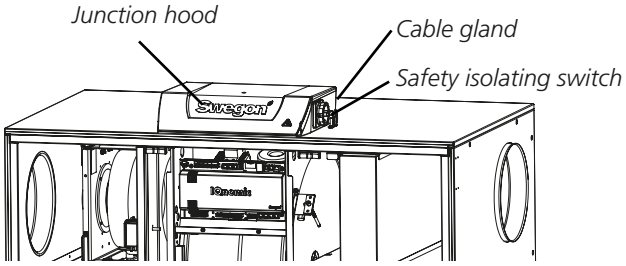
3.7 Connection to the Electric Power Grid

Connection of the power supply cable from the mains must be wired across a safety isolating switch.

3.7.1 Access

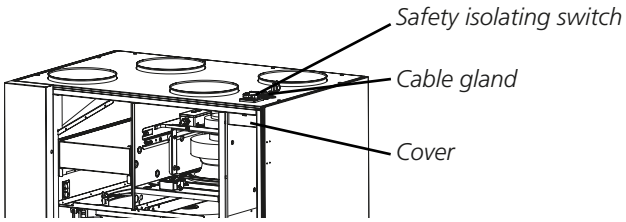
COMPACT Unit

Remove the upper section of the junction hood. Run the cable through the cable gland on the backside of the junction hood.



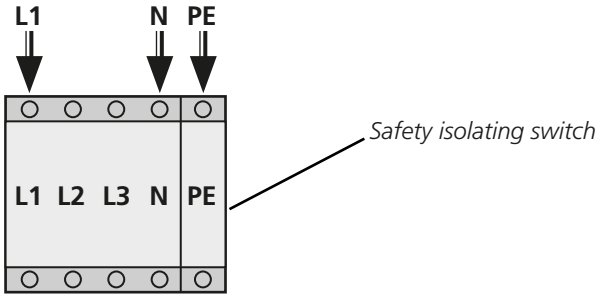
COMPACT Top

Open the inspection panel and dismantle the cover. Run the cable through the cable gland by the safety isolating switch.



3.7.2 Electrical Connections

1-phase, 3-wire, 230 V -10/+15%, 50 Hz, 10 AT.



3.8 To Connect External Cables

3.7.1 COMPACT Unit

To gain access to the control unit, remove the cover plate in front of the heat exchanger. Remove the upper section of the junction hood. Cables from external sources can be run in to the electric cubicle through the rubber diaphragm on the backside of the junction hood.

N.B.! Cables for external communication outside the air handling unit must be arranged at a minimum distance of 100 mm from any current-carrying (live) cable.

3.7.2 COMPACT Top

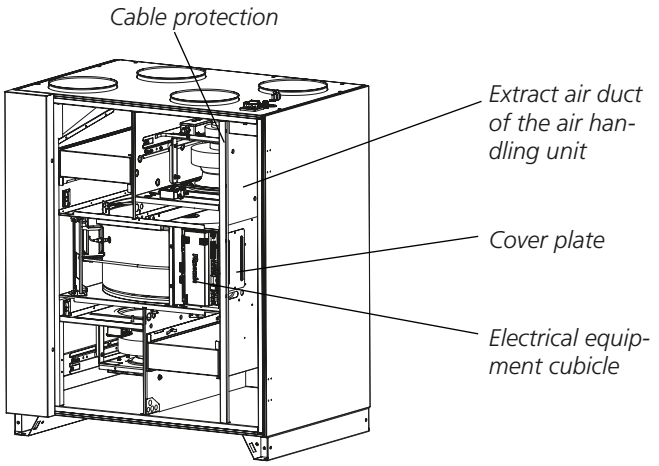
To gain access to the power unit, remove the cover plate in the unit's extract air duct.

Cables from external sources can be run into the air handling unit through the rubber diaphragm by the extract air intake, located at the top of the unit.

The external cables can be extended in the existing cable protection in the extract air duct of the unit. Bundling straps are pre-fitted inside the cable protection. After running the cables, secure them by pulling the bundling straps tight.

Cables can be run in to the electric cubicle according to appropriate hole indication in the rubber diaphragm.

N.B.! Cables for external communication outside the air handling unit must be arranged at a minimum distance of 100 mm from any current-carrying (live) cable.



4 COMMISSIONING

4.1 General

Sequence for commissioning:

1. Check that there are no foreign objects in unit, ducting system or functional sections.

2. Turn the safety isolating switch to the ON position (I).

3. Select the language desired, if you have not already done so. See Section 6.2 or 14.1.

4. The unit has factory settings which make it ready to use. See Section 21.2 Commissioning record.

However, in many cases, these settings need to be adjusted to suit the current installation.

Program the switch clock, operating conditions, temperatures, airflows and functions according to the procedures in Sections 5-16.

Select whether l/s, m3/s or m3/h shall be used as the flow unit.

(INSTALLATION LEVEL in the HAND-HELD MICRO TERMINAL menu).

Fill out the Commissioning Record and save it in the document pocket of the unit.

5. Activate, if needed, manual or auto operation (MAIN MENU) or lock the speed of the fans (AIR ADJUSTMENT menu).

Adjust the ducting system and air devices as described in Section 4.2.

6. Finish off with a filter calibration as described in Section 7.4.2.

Registered design. The company reserves the right to make design changes without prior notice.

4.2 Adjusting the Duct System and Air Devices

In order to prevent the fans from consuming more power than necessary, it is important to keep the pressure drop in the system as low as possible.

It is also important that ducting systems and air devices are correctly adjusted to provide the comfort expected.

When adjusting air devices and the duct system installed in combination with the GOLD, it is appropriate to follow the proportionality method.

This means that the proportion between the airflows in branch ducts stays constant even if the airflow in the main ducts is changed. The same proportion applies to the air devices in the installation.

When adjusting the ducting system there is provision for locking the speed of the fans in the unit to a specific pre-set flow rate, see Section 6.5.

4.2.1 Adjustment Sequence

The system should be adjusted in the following order:

1. Adjust of the air devices in each branch duct.
2. Adjust the branch ducts.
3. Adjust the main ducts.

4.2.2 Adjustment Procedure

1. Set all the air devices and dampers to the fully open position.

2. Calculate the ratio of the airflow reading to the design airflow of all the air devices, branch ducts and main ducts.

The air device in every branch that has the lowest ratio should be fully open. Use this air device as an INDEX AIR DEVICE. The same applies to branch dampers and main dampers.

When you've completed the adjustments, one air device in every branch, one branch damper and one main damper should consequently be fully open.

3. Start adjusting the main duct that has the highest ratio and the branch duct in the main duct that has the highest ratio. Starting from this point enables you to "press" the air in front of you toward the sections of the system that have the least air.

4. Adjust the last air device on the duct branch so that it will have the same ratio as the index device. This air device will serve as the REFERENCE AIR DEVICE. Often it is the last air device on the branch that has the lowest ratio and should be open. In this case, the same air device serves as the index device and reference device.

5. Throttle the other air devices in the branch to the same ratio as the reference device.

Note! The ratio in the reference device will change every time another air device is throttled, so in practice the ratio for the reference device can be set slightly higher. The reference device must be measured in between each air device throttled.

6. Go to the branch that had the next highest ratio and adjust the air devices there, etc.

Note! All branch dampers should be fully open until all air devices have been adjusted.

7. Throttle the branch damper that had the highest ratio to the same ratio that the branch of the lowest ratio had.

Note! Keep in mind that the index damper changes ratio; proceed as described in item 5.

8. When all branches have been adjusted, throttle the main dampers in the same manner.

Also see the example below on how to carry out adjustments.

Example on how to carry out adjustments

– Start adjusting duct branch B, since this one has the highest ratio.

– The last air device, B3, has the lowest ratio and should be fully open.

Adjust the other air devices, B1 and B2, so that these will have the same ratio as air device B3 (see item 5 above).

– Now adjust the air devices in branch duct C. Air device C4 should be fully open; throttle the others to the same ratio.

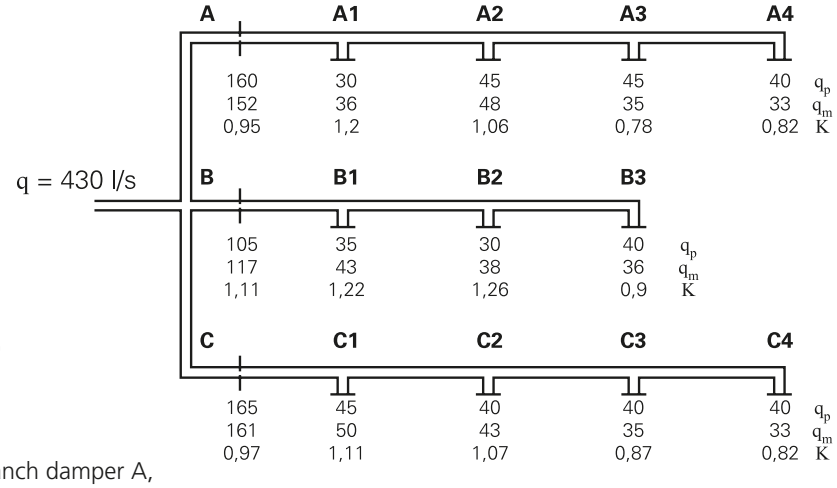
– Adjust the air devices in branch duct A. The index air device here is air device A3, which means that you first throttle air device A4 (the reference device) to device A3:s ratio.

Thereafter the others are adjusted to the same ratio as air device A4.

– Throttle branch damper B to the same ratio as branch damper A, throttle branch damper C to the same ratio as branch damper A.

Check that all dampers have the same ratio.

When the adjustment has been completed, 3 air devices and one branch damper should stand fully open to obtain the lowest possible pressure in the system.



q_p = design airflow (l/s)
q_m = airflow reading (l/s)

$$K\ (\text{Ratio}) = \frac{q_m}{q_p}$$

4.3 To Adjust the Pressure Balance

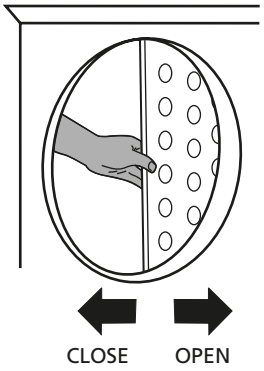
4.3.1 General

The air handling unit is equipped with an adjustment plate designed for achieving a correct air leakage direction across the heat exchanger. This prevents the extract air from being carried over to the supply air.

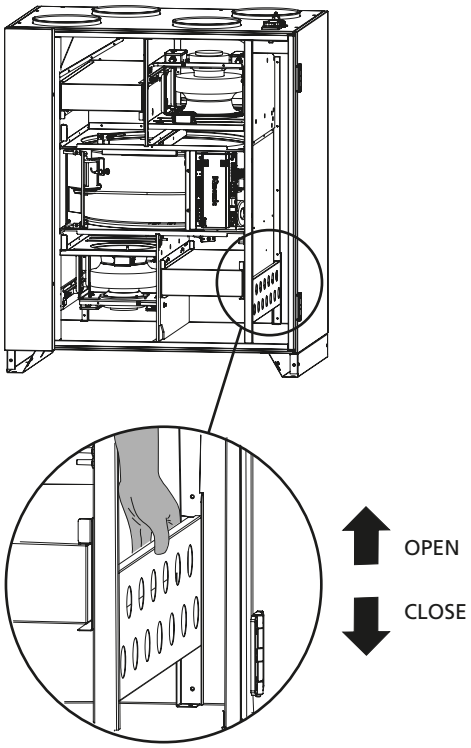
The pressure balance in the unit should be adjusted when the ventilation system has been fully installed and all the air diffusers have been airflow-adjusted as well as for the supply air and extract air flows that prevail while the air handling unit is operating normally.

Adjustment plate

COMPACT Unit



COMPACT Top



Registered design. The company reserves the right to make design changes without prior notice.

4.3.2 To Ensure the Correct Leakage Direction

The pressure balance in the unit is adjusted by means of a adjustment plate mounted in the extract air inlet. IMPORTANT! If you change COMPACT Unit to the left-hand version, you must move the pressure adjusting plate (must always be situated in the extract air inlet).

Connect a pressure gauge to the pressure measurement tappings of the unit. The COMPACT Unit has four pressure measurement tappings. Use the two tappings nearest the extract air duct! See illustration. The COMPACT Top has two pressure measurement tappings. See illustration. The blue pressure measurement tapping is used for measuring the negative pressure in the extract air section and the white pressure measurement tapping is used for measuring the negative pressure in the supply air section.

Note that both pressure measurement tappings are used for measuring negative pressure.

MEASURED VALUES
The negative pressure in the extract air section should be greater or the same as the negative pressure in the supply air section.

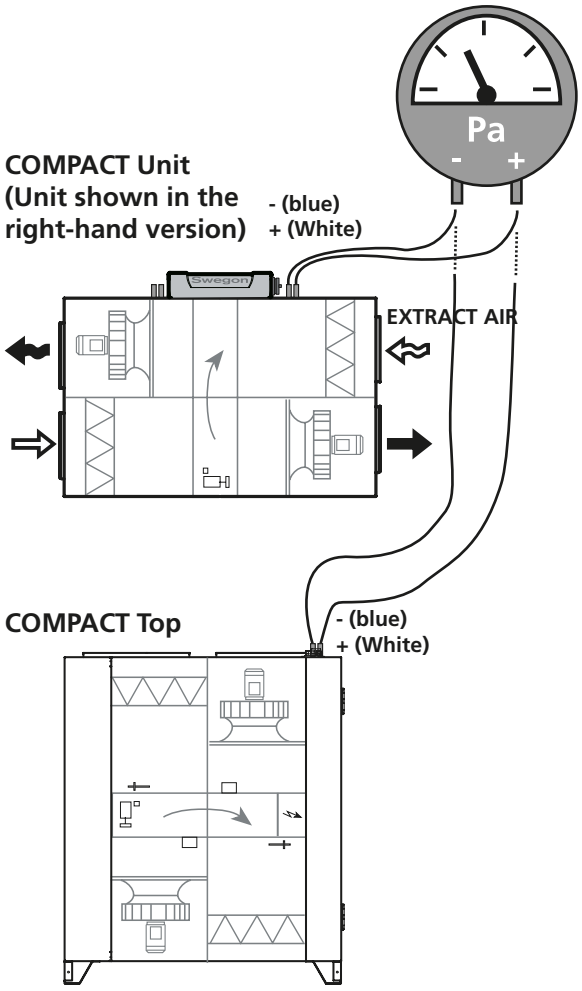
If the negative pressure in the extract air section is the same or up to 20 Pa greater than the negative pressure in the supply air section, then you've finished this adjustment.

DEVIATIONS
If the negative pressure in the extract air section is less than that in the supply air section, the adjustment plate must be readjusted as follows:

1. Stop the air handling unit, open the inspection door and slightly close the adjustment plate in the air handling unit's extract air inlet.
3. Close the inspection door and restart the unit.
4. Measure the pressures.

   Repeat this procedure until the negative pressure in the extract air section is the just as high or up to 20 Pa higher than the negative pressure in the supply air section (0–20 Pa).
5. If the negative pressure in the extract air section is higher than 20 Pa compared to the supply air section, although the adjustment plate is completely open, the leakage and purging air flow will be more than anticipated. This means that the actual extract air flow will deviate from the preset extract airflow. The deviation increases as the pressure differential increases.

Pressure measurement tappings – leakage direction



5 HAND-HELD MICRO TERMINAL AND HOW TO USE THE MENUS

5.1 HAND-HELD MICRO TERMINAL

5.1.1 General

The hand-held micro terminal consists of an encapsulated control box with a 3-metre long cable for connection to the air handling unit by means of a quick connector.

The hand-held terminal has an illuminated display, 6 push-buttons and a red LED for indicating alarms.

5.1.2 Buttons

The buttons have the following functions:

ENTER confirms your selection and proceeds to next menu level.

ESCAPE reverts to the previous menu.

ADVANCE UPWARD or to the LEFT.

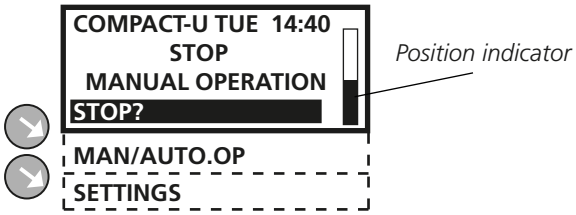
ADVANCE DOWNWARD or to the RIGHT.

DECREASES the value of the highlighted setting.

INCREASES the value of the highlighted setting.

5.1.3 Display Screen

The display screen has 4 lines. Many of the menus however have several lines and these are shown line for line as you press the ADVANCE DOWNWARD button. The position indicator shows where you are in the menu.



5.1.4 Abbreviations

The following abbreviations are used in the menus

SA = Supply air (E.g. SA FAN = Supply air fan)

EA = Extract air

OUTD = Outdoor air

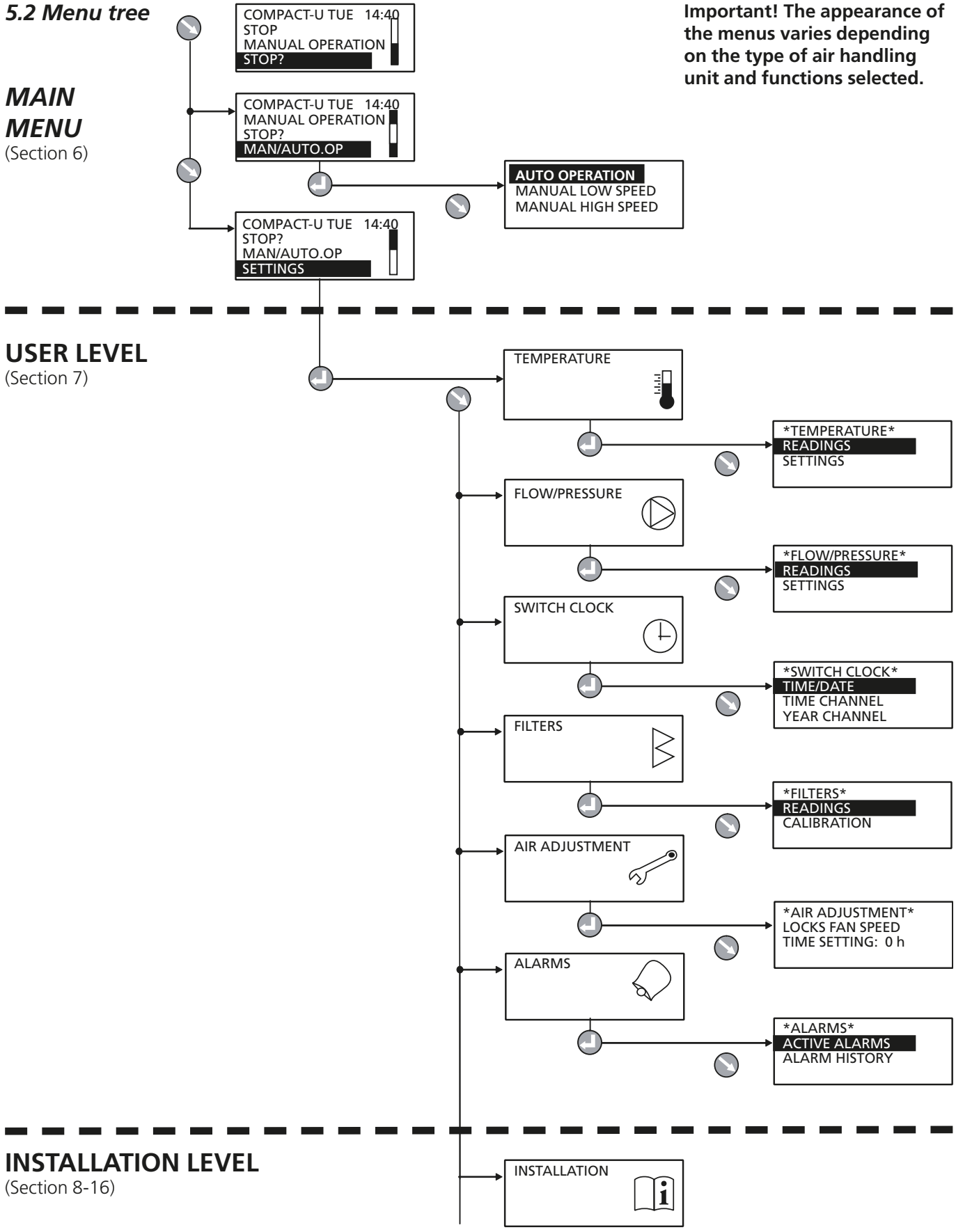
FV = Anti-frosting monitor

HEAT EXCH = Heat exchanger

Registered design. The company reserves the right to make design changes without prior notice.

5.2 Menu tree

Important! The appearance of the menus varies depending on the type of air handling unit and functions selected.



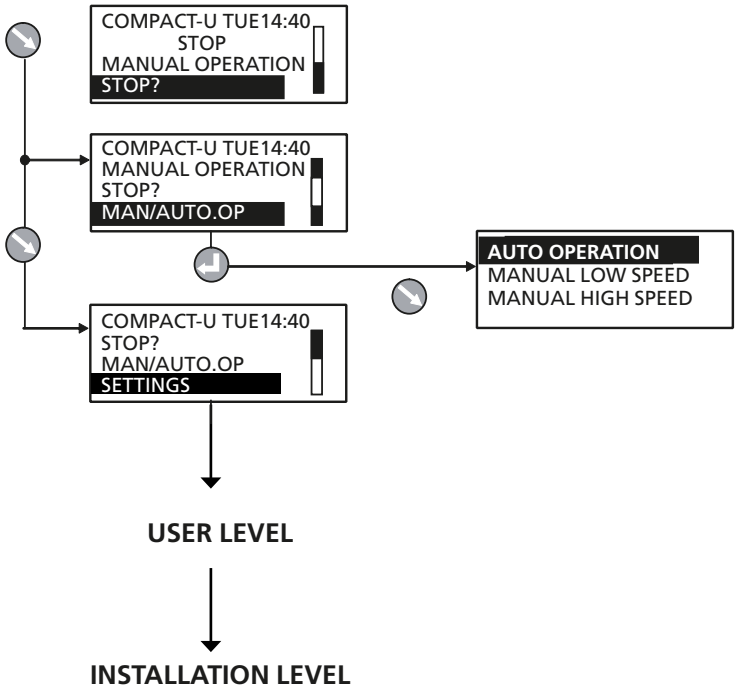
6 MAIN MENU

6.1 General

The main menu is normally shown if no other menu has been selected.

The display automatically returns to the main menu after 30 minutes.

The content in the menu changes depending on the operating mode selected other functions that affect the present operating mode and possible tripped alarms.



6.2 Selection of Language

When the air handling unit is started up for the first time, a language selection menu is displayed.

Select the language desired.

If you want to change language at a later opportunity – or if you've selected the wrong language – you can change the language at INSTALLATION LEVEL under HAND TERMINAL. See Section 14.1.

6.3 Changing Operating Mode

You can start and stop the air handling unit or change over to manual or automatic operation from the main menu.

⚠ The air handling unit should normally be started and stopped from the hand-held micro terminal; not by switching the safety isolating switch on and off.

When the air handling unit is started up, menus for the various delays that are part of the starting sequence are shown.

See also Section 10.1.1, Starting Sequence.

6.4 Settings

When selecting SETTINGS in the main menu, you will advance to User Level and Installation Level.

See Section 7.

Registered design. The company reserves the right to make design changes without prior notice.

7 USER LEVEL

7.1 Temperature

The basic functions can be preset at INSTALLATION LEVEL and the values can be read and set at USER LEVEL. **See also Section 9.2 in which the functions for temperature are described in detail.**

IMPORTANT! If you intend to substantially alter the temperature settings, you should first stop the air handling unit before doing so.

7.1.1 Readings

Used for checking the performance.

7.1.2 Settings

ERS REGULATION 1
The control unit regulates the relationship between the supply air and the extract air temperatures according to a factory preset curve.

Settings *(see the chart to the right as well):*

Value	Setting range	Factory settings
Step	1 - 4	1
EA/SA Differential	1-5 °C*	2 °C
Breakpoint (refers to extract air temperature)	15-23 °C*	20 °C

ERS REGULATION 2
The control unit regulates the relationship between the supply air and extract air temperatures according to a custom-plotted curve. The curve has three adjustable breakpoints.

Settings *(see the chart to the right as well):*

Value	Setting range	Factory settings
Extract air temperature		
X1	10-40 °C	15 °C
X2	10-40 °C	20 °C
X3	10-40 °C	22 °C
Supply air temperature		
Y1	10-40 °C	20 °C
Y2	10-40 °C	18 °C
Y3	10-40 °C	14 °C

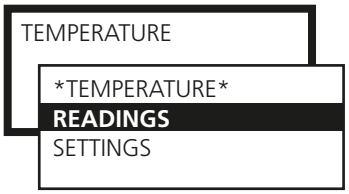
SUPPLY AIR REG.
Settings:

Value	Setting range	Factory settings
Supply air temperature setpoint	15-40 °C*	21.5 °C

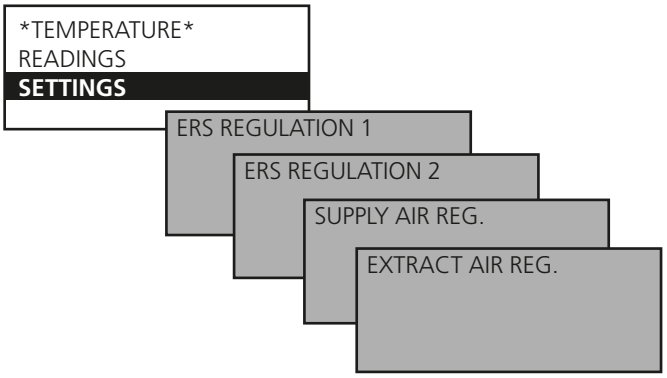
EXTRACT AIR REG.
Settings:

Value	Setting range	Factory settings
Extract air/room temp. Setpoint	15-40 °C*	21.5 °C
Min. supply air temperature	13-25 °C*	15 °C
Max. supply air temperature	18-45 °C*	28 °C

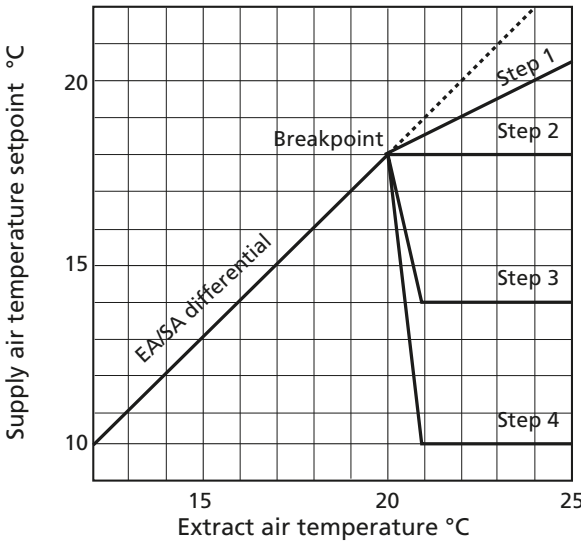
**) The setting range can be changed. See 14.3, Min/Max Adjustment.*



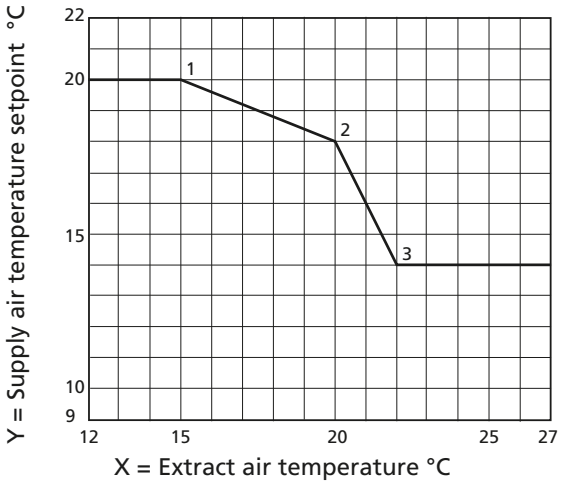
Important! The appearance of the menus varies depending on the type of air handling unit and functions selected.



ERS Regulation 1



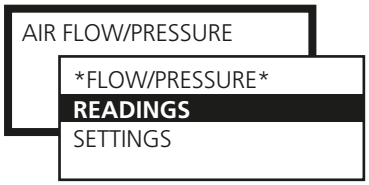
ERS Regulation 2



7.2 Air flow/Pressure

Basic functions are set at INSTALLATION LEVEL and values are read and set at USER LEVEL.

Therefore see also Section 9.3, in which the functions for flow/pressure are described in detail.



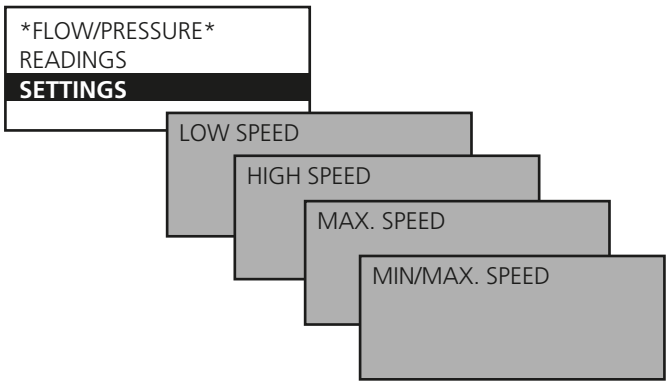
7.2.1 Readings

Used for performance checks.

7.2.2 Settings

The functions selected at INSTALLATION LEVEL and the min. and max. airflows of each unit size (see the table below) determine which values can be set.

Values for airflow (l/s, m3/s, m3/h), pressure (Pa) or input signal strength (%) can be preset depending on the function selected.



LOW SPEED
Must always be preset! The value for low fan speed cannot be higher than the value for high speed. Low speed can be set to 0, which means that the fan is standing still.

HIGH SPEED
Must always be preset! The value or pressure for high fan speed cannot be lower than the value for low fan speed.

MAX SPEED
Max speed is only appropriate for functions such as pressure regulation, Heating BOOST or Cooling BOOST. The value for max fan speed cannot be lower than the value for high fan speed.

MIN/MAX SPEED
Min/max fan speed is only appropriate for demand-controlled operation. The lowest and highest permissible flows are preset for each of the fans. This means that the fans will not operate outside these limits, regardless the load.

Min/Max Airflows

AIRFLOW SIZE	MIN FLOW COMPACT UNIT AND COMPACT TOP		MIN FLOW COMPACT UNIT AND COMPACT TOP	
	m^3/h *	m^3/s	m^3/h	m^3/s
02	300	0,08	800	0,23
03	300	0,08	1300	0,36

** When entering settings, round off the values to the nearest adjustable step.*

Registered design. The company reserves the right to make design changes without prior notice.

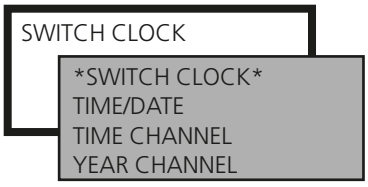
7.3 Switch clock

Basic functions for the switch clock can be preset at INSTALLATION LEVEL under FUNCTIONS/OPERATION and the values can be read and set at USER LEVEL.

TIME/DATE
The current date and time can be set and adjusted whenever required.
The switch clock automatically takes leap years into consideration.
Automatic changeover between summer time/winter time to EU Standard has been preset.
This changeover function can be blocked at INSTALLATION LEVEL under FUNCTIONS/OPERATION.

TIME CHANNEL
Times and days can be set when the unit is to run at high speed, low speed or be stopped.
Eight different time channels can be set. If the same in-operation times are to apply every day of the week (Mon-Sun), you need only program one time channel. Different operation times for each day of the week can be programmed by programming a time channel for each day (Mon-Fri, Sat-Sun or Mon, Tues, Wed, etc)
The time can be set as 00:00-00:00 if the deviating in-operation period is desirable for the entire 24 hours period.

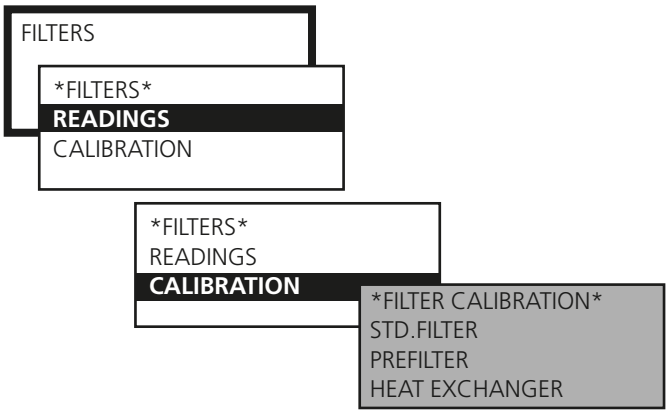
YEAR CHANNEL
The year channels make it possible to set deviating in-service times for parts of the day during certain parts of the year. Eight different year channels (yearly time schedules) can be set. The year channels over-modulate the time channel during the hours of the day and the days that the year channel is active. The year channel dates indicate the dates between which the year channel shall apply and the year channel hours indicate the hours of the day between which the year channel will steer the controller to operate the rotary heat exchanger at a specified speed. Other times within the year channel still apply to that time channel.
The time can be set as 00:00-00:00 if the deviating in-operation period is desirable for the entire 24 hours period.
Functions for summer night cooling, prolonged operation, etc., operate also when the year channel is active.



Settings:

Value	Setting range	Factory setting
TIME/DATE		
Day	Mon-Sun	Automatic
Time	00:00-23:59	Current
Date	Day/Month/Year	Current
TIME CHANNEL 1-8		
Operation	Low speed/High speed*	High speed
Time	00:00-23:59	00:00-00:00
Period	Not active	Not active
	Mon, Tues, Wed etc	
	Mon-Fri	
	Mon-Sun	
	Sat-Sun	
YEAR CHANNEL 1-8		
Operation	Not active	Not active
	Stop/Low sp./High sp.	
Time	00:00-23:59	00:00-00:00
Period	From Day/Month/Year	01/01/2005
	To Day/Month/Year	01/01/2005

*) Shows Stop/Low speed/High speed if this function is selected at INSTALLATION LEVEL under FUNCTIONS/OPERATION.



7.4 Filters
(and anti-frosting function of rotary heat exchanger)

There are two types of filter monitoring:
Calculated filter monitoring (preset at factory) monitors the fan's speed increase conditional on the degree of fouling in the filter. The calibration involves taking airflow and fan speed readings. An alarm is initiated when the fan speed has increased by 10% above the preset alarm limit.
Filter monitoring with a pressure sensor (accessory) measures the pressure drop across the filter. The alarm limit is preset in Pa.

7.4.1 Readings

When reading the filter status, the first value shows current value and the second value shows current alarm limit.

7.4.2 Calibration - Filters

The filters should be calibrated for the first time in conjunction with commissioning, when the duct system, air devices and eventual adjustment plates have been fitted and adjusted; after that every time the filter media are changed.

Calibration should be activated for both the supply air and the extract air if both filters are changed or for only for one airflow direction if only one filter has been changed.
When filter calibration has been activated, the unit runs at high speed for about 3 minutes.
After the filter has been calibrated, a speed increase of 10%, or a pressure rise (= fouling of the filters) of 100 Pa is permissible, after which an alarm is initiated indicating a fouled filter.
The alarm limit can be changed at INSTALLATION LEVEL under ALARM SETTINGS.

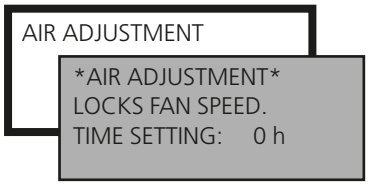
7.4.3 Calibration - Rotary Heat Exchanger

If the anti-frosting function accessory for heat exchanger is installed (see 9.6.1.1) calibration can be selected from this menu. When calibration R-HX is activated the fans are accelerated to high speed for about 3 minutes.

7.5 Air Adjustment

The speed of the fans can be locked for up to 72 hours. This is practical when making air adjustments in the duct system and air devices.

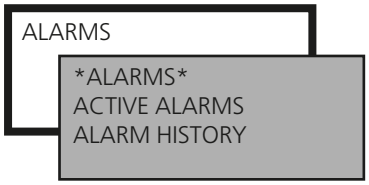
The period desired is preset but can be interrupted earlier by selecting STOP in the menu or by changing the time setting to 0.



7.6 Alarms

If an alarm is initiated, this is shown in the hand-held terminal both as clear text and by a blinking red diode.

This menu enables you to read alarms quickly.



ACTIVE ALARMS
Shows alarms that are active but have not initiated an alarm signal in the display. This applies to alarms that have a long delay, i.e. airflow or temperature alarms.

ALARM HISTORY
The 10 most recent tripped alarms are shown.

⚠ Alarm settings can be entered at INSTALLATION LEVEL under ALARM SETTINGS.

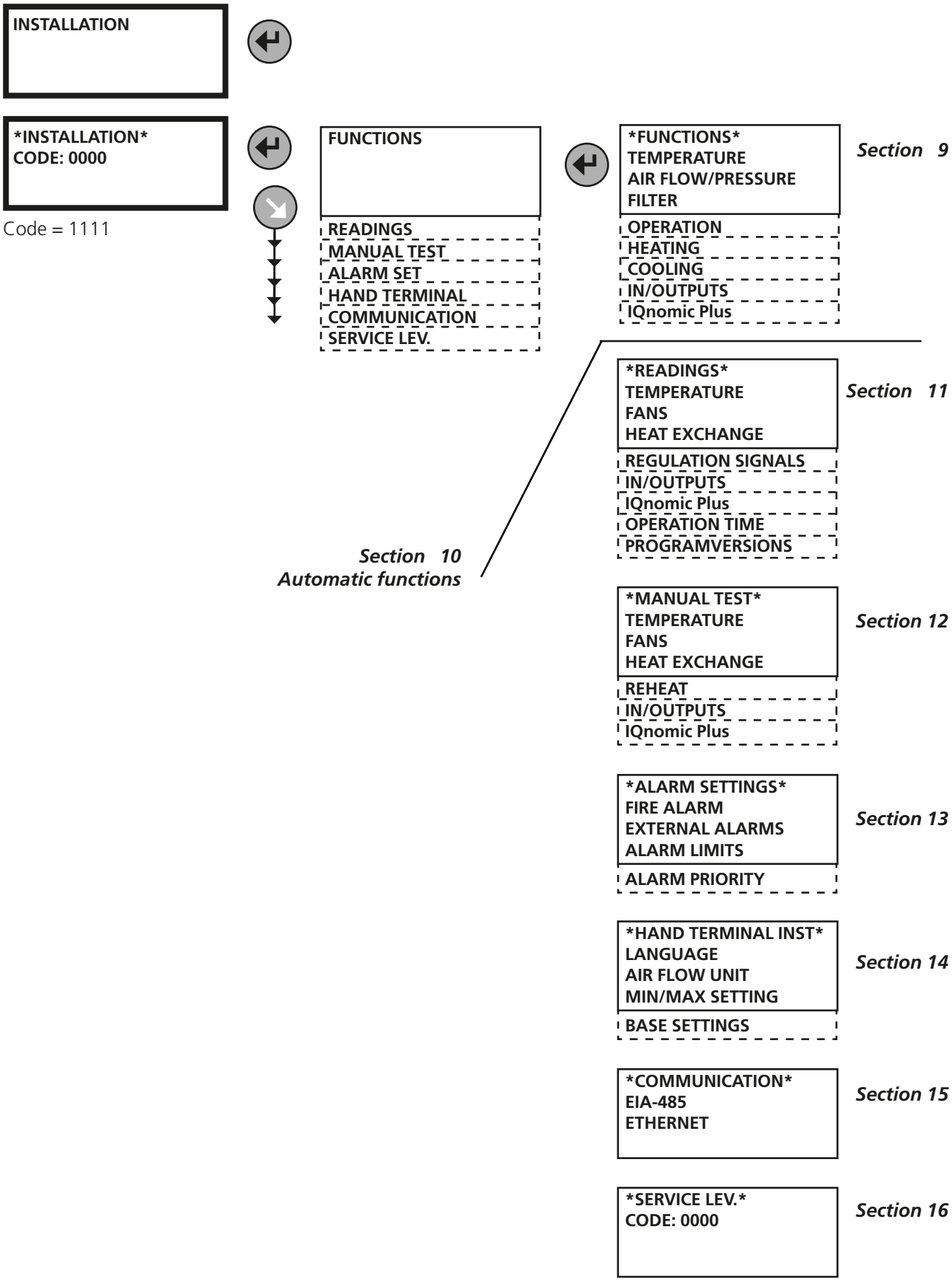
For complete description of alarms, see Section 18.

Registered design. The company reserves the right to make design changes without prior notice.

8 INSTALLATION LEVEL

Important! The appearance of the menus varies depending on the type of air handling unit and functions selected.

8.1 Menu Survey



9 FUNCTIONS

9.1 Temperature

Basic functions can be set at INSTALLATION LEVEL and values are read and set at USER LEVEL.

IMPORTANT! If you intend to substantially alter the temperature settings, you should first stop the air handling unit before doing so.

9.2 Temperature Regulation

Select ERS Regulation, Supply air regulation or Extract air regulation.

If ERS Regulation is selected, select between 1 and 2.

Control sequence for ERS regulation and Supply air regulation:

1. The temperature efficiency of the air handling unit's heat exchanger is modulated to provide max. heat recovery.
2. After that the air heater, if installed, will begin to generate heat.
3. If a downstream heating coil is not installed, or if the its output is not adequate, the supply air fan will be automatically and variably downspeed-regulated to convey air at a lower flow rate.

A neutral zone can be preset, which allows a lower supply air temperature setpoint before regulation to a lower flow rate begins. See 8.3.4

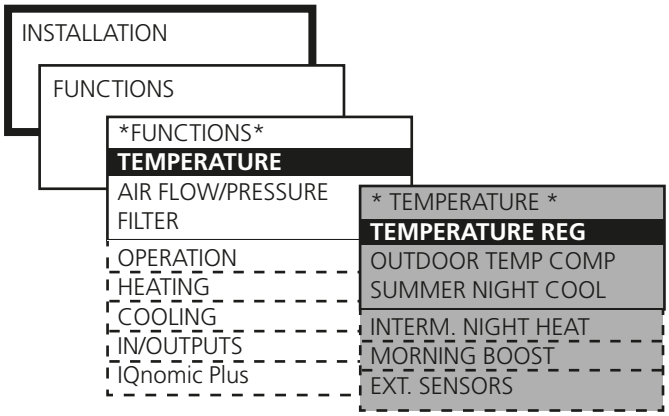
When the supply airflow is regulated to a lower rate, the heat exchanger will have "excess heat", i.e. warm extract air, giving it capacity to maintain the supply air temperature required.

As the supply airflow is regulated to a lower rate, the air pressure in the premises will become negative and this will instead cause outdoor air to be sucked in through leakage spots such as doors and windows. This outdoor air will then be heated by the ordinary heating system of the premises.

Downspeed regulation to lower the airflow rate occurs from the current preset flow (high speed or low speed), down to half of this flow rate. The degree of regulation to a lower rate is also limited by the min flow setting of the unit. When preset flow for low speed is near the min flow rate, the effect of this regulation to a lower rate will be small.

Control sequence for Extract air regulation:

1. The temperature efficiency of the air handling unit's heat exchanger is modulated to provide max. heat recovery.
2. After that, the re-heating coil, if installed, will begin to generate heat.



Important! The appearance of the menus varies depending on the type of air handling unit and functions selected.

Registered design. The company reserves the right to make design changes without prior notice.

9.2.1.1 ERS Regulation

ERS regulation means Extract air temperature-Related Supply air temperature regulation. This means that the temperature of the supply air is regulated in relation to the temperature of the extract air. Under normal circumstances, the supply air temperature is regulated to be a few degrees lower than the extract air temperature. In this way, the heat exchanger will provide optimal performance, and this means excellent operating economy. ERS regulation is suitable for use when there is excess heat in the premises generated, for example, by machinery, lighting or people and the supply air devices in the premises are suitable diffusing air below room temperature.

ERS REGULATION 1

The control unit regulates the relationship between the supply air and extract air temperatures according to a factory-preset curve.

See the chart to the right.

The steps, breakpoint and EA/SA differential plotted in the curve can be changed at USER LEVEL under TEMPERATURE/SETTINGS.

Settings:

Value range	**Setting setting**	**Factory**
Step	1 – 4	1
Breakpoint (refers to extract air temp.)	15-23 °C	20 °C
EA/SA-Differential	1-5 °C	2 °C

The setting range for the breakpoint and EA/SA differential is limited by the Min. and Max. settings at *INSTALLATION LEVEL under HAND TERMINAL.*

ERS REGULATION 2

This is used when special needs and conditions are such that the factory preset ERS regulation 1 curve cannot provide the results required. Conditional on which settings are made, it may be necessary to install a post-heating coil.

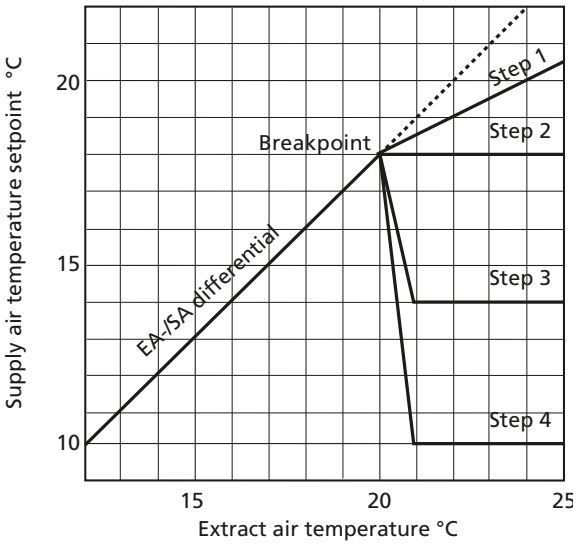
An individually adapted curve regulates the relationship between the supply air and extract air temperature.

See the chart to the right.

The following settings are possible at USER LEVEL under TEMPERATURE/SETTINGS:

Value	**Setting range**	**Factory setting**
Extract air temperature		
	X1 10-38 °C	15 °C
	X2 11-39 °C	20 °C
	X3 12-40 °C	22 °C
Supply air temperature setpoint		
	Y1 10-40 °C	20 °C
	Y2 10-40 °C	18 °C
	Y3 10-40 °C	14 °C

FRT-reglering 1

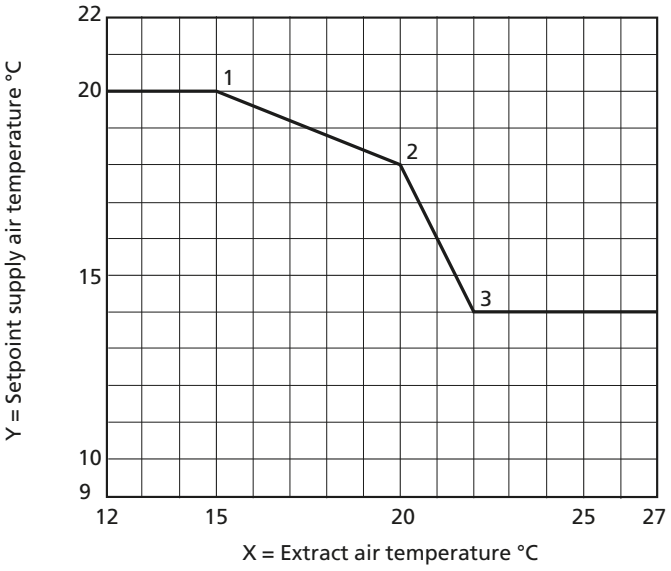


Factory setting means:

If the extract air temperature is below 20 °C (breakpoint), the supply air temperature setpoint will be automatically regulated to be 2 °C (EA/SA differential) lower.

If the extract air temperature is above 20 °C, the supply air temperature setpoint will follow the curve according to Step 1.

ERS regulation 2



Breakpoints according to factory setting means:

If the extract air temperature is below 15 °C (X1) the setpoint for supply air temperature is constant 20 °C (Y1).

If the extract air temperature is 20 °C (X2) the supply air temperature set point will be 18 °C (Y2).

If the extract air temperature is above 22 °C (X3), the supply air temperature setpoint will be constantly 14 °C (Y3).

9.2.1.2 Supply Air Regulation

Supply air regulation involves keeping a constant supply air temperature without consideration to the load in the premises.

This type of regulation can be used when the load and temperatures of the premises are predictable. In most cases a reheating coil needs to be installed; possibly a cooling coil as well.

The following settings can be entered at USER LEVEL under TEMPERATURE/SETTINGS:

Value	Setting range	Factory setting
Supply air temperature setpoint	15-40 °C	21.5 °C

Setting range for the setpoint is limited by Min. and Max. settings at INSTALLATION LEVEL under HAND TERMINAL.

9.2.1.3 Extract Air Regulation

Extract air regulation involves keeping a constant temperature in the extract air duct (premises), by regulating the supply air temperature. This provides a uniform temperature in the premises regardless of the load and this type of regulation requires the installation of a reheating coil; possibly a cooling coil as well.

The extract air temperature is measured by the temperature sensor inside the COMPACT unit.

If this internal temperature sensor does not give an adequate representative extract air temperature readings, an external room temperature sensor can be installed and wired to the control unit's connection marked "Internal Bus-1".

The following settings can be entered at USER LEVEL under TEMPERATURE/SETTINGS:

Value	Setting range	Factory setting
Extract air-/room temp. setpoint	15-40 °C	21.5 °C
Min. Supply air temperature	13-18 °C	15 °C
Max. Supply air temperature	25-45 °C	28 °C

Setting range for the various values is limited by Min. and Max. settings at INSTALLATION LEVEL under HAND TERMINAL.

Registered design. The company reserves the right to make design changes without prior notice.

9.2.2 Outdoor Temperature Compensation

Temperature
Outdoor temperature compensation can be activated if the premises are abnormally subjected to the effects of seasonal cold air or hot air due to leakage through large windows, for instance.

The supply air temperature setpoint is compensated if the air handling unit is operating in the supply air regulation mode, and the extract air temperature setpoint is compensated if the air handling unit is operating in the extract air regulation mode. This function will have no effect if the unit is operating in the ERS regulation mode.

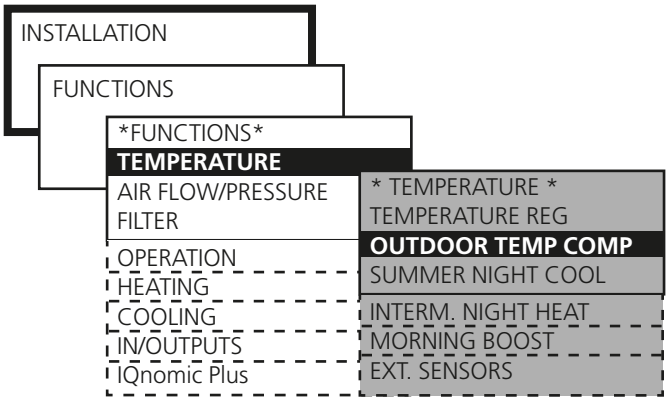
The preset temperature setpoint is influenced if the outdoor temperature drops below the preset X2 breakpoint (winter compensation) and above the preset X3 breakpoint (summer compensation).

See the chart to the right.

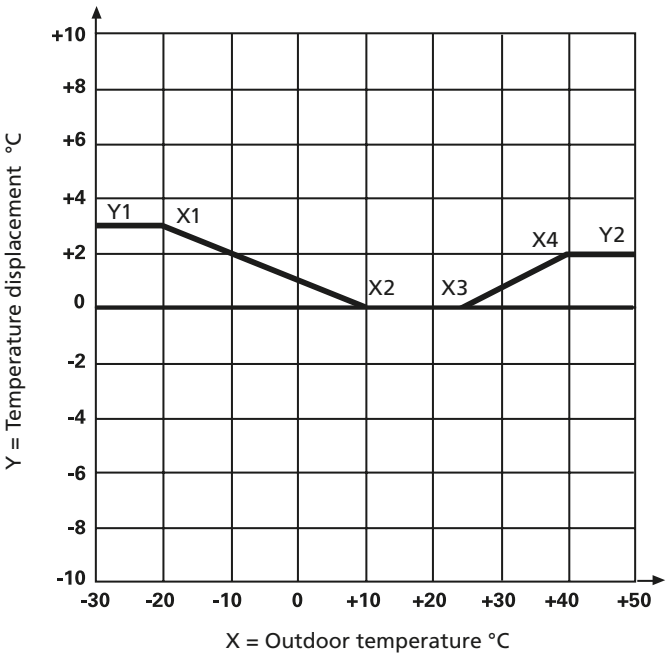
It is possible to set negative summer compensation.

Settings:

Value	Setting range	Factory setting
Winter compensation		
Temperature displacement Y1	+0 – +10 °C	+3 °C
Breakpoint X1	-30 – -10 °C	-20 °C
Breakpoint X2	-10 – +15 °C	+10 °C
Summer compensation		
Breakpoint X3	+15 – +25 °C	+25 °C
Breakpoint X4	+25 – +40 °C	+40 °C
Temperature displacement Y2	-10 – +10 °C	+2 °C



Outdoor temperature compensation



Winter compensation in accordance with factory setting involves:

Outdoor temperature +10 °C (Breakpoint X2): Compensation starts and gradually takes place between 0–3 °C down to outdoor temperature -20 °C.

Outdoor temperature -20 °C (Breakpoint X1): Constant compensation takes place with 3 °C (temperature displacement Y1).

Summer compensation in accordance with factory setting involves:

Outdoor temperature +25 °C (Breakpoint X3): Compensation starts and gradually takes place between 0–2 °C up to outdoor temperature +40 °C.

Outdoor temperature +40 °C (Breakpoint X4): Constant compensation takes place with 2 °C (temperature displacement Y2).

9.2.3 Summer Night Cooling

The lower temperature at night is utilised to cool down the building structure. This reduces the cooling load during the first hours of the day. If a cooling unit is installed, its in-operation hours will be minimised, thus offering savings. If no cooling unit is installed, a certain cooling effect will still be realised.

When summer night cooling function is activated, the unit fans operate at high speed, with a supply air setpoint of 10°C, from the preset time until the conditions necessary for stop are satisfied.

Conditions to be met to start summer night cooling at the preset time:

• The extract air temperature should be higher than the preset value

• The extract air should be at least 2°C warmer than the outdoor air.

• The outdoor temperature should be above the preset value.

• Heating has not been required between 12.00–23.00 hours.

• The unit must not operate in the high speed mode or be stopped from an external source or manually from the hand-held micro terminal.

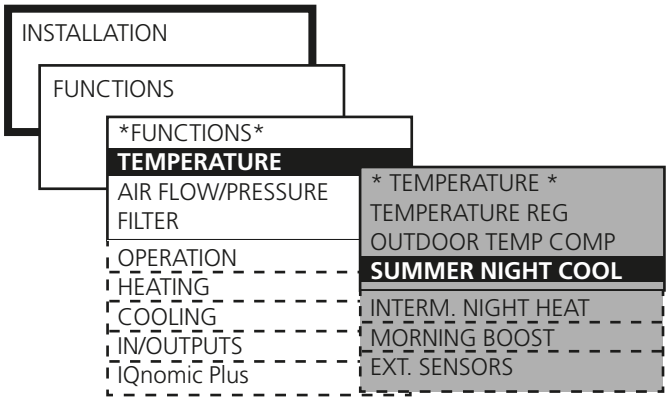
Conditions to be met to stop summer night cooling at the preset time:

• The extract air temperature drops below the preset value.

• The outdoor temperature drops below the preset value.

• Switch clock or external input calls for high speed.

• The extract air is less than 1 °C warmer than the outdoor air.



The function starts once per set time period.

Settings:

Value	Setting range	Factory setting
Extract air temperature for start	17 - 27 °C	22 °C
Extract air temperature for stop	12 - 22 °C	16 °C
Outdoor temperature for stop	5 - 15 °C	10 °C
Supply air setpoint	10 - 20 °C	10 °C
Operating period	00:00-00:00	23:00-06:00

Registered design. The company reserves the right to make design changes without prior notice.

9.2.4 Intermittent Night-time Heating

The unit is utilised to heat the premises when it is normally stopped by the switch clock.

The function requires that an external room sensor is connected and that the air handling unit is provided with air heater for reheating the air. Connect the TBLZ-1-24-2 Room sensor by means of the modular cable supplied, to an optional connection marked Internal BUS 1. The capacity of the function will be best if the COMPACT is provided with a recirculation damper (not Swegon supply) and a shut-off damper for outdoor air and exhaust air.

When the function is activated, the air handling unit detects when the room temperature drops below the preset start temperature. The unit starts with preset flows and the supply air temperature setpoint.

If extract air fan operation is not desirable, the extract airflow can be set to 0.

The damper output can be set to 0. This means that the connected dampers (such as shut-off dampers for outdoor air and extract air) will not be affected. These dampers are normally closed when the air handling unit is stopped and they also remain closed.

At the same time, the damper in the air recirculation section, if included, will open.

Conditions to be met for intermittent night-time heating to start:

• The unit should operate in a time channel/switch clock stop.

• The room temperature should be below set start temperature.

Conditions to be met for intermittent night-time heating to stop:

• High speed or external/manual stop should be activated.

• Room temperature should be above the preset stop temperature.

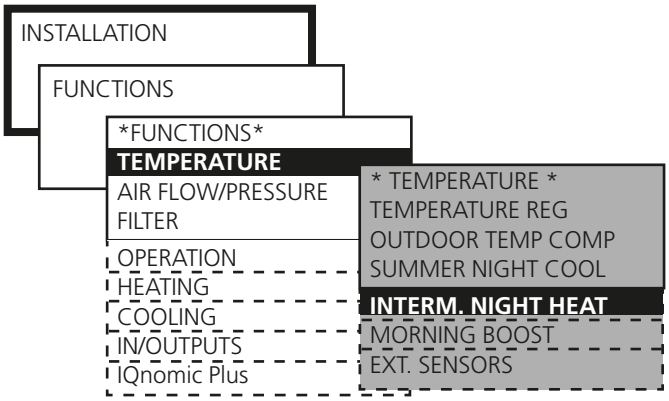
• Alarm with preset stop priority has tripped.

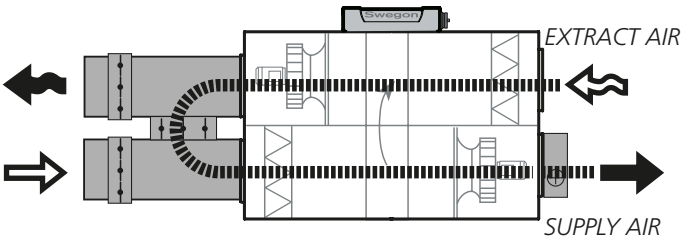
If the needed, the air handling unit fans will continue to operate to cool the electric air heater although other conditions for stop have been met.)

Settings:

Value	Setting range	Factory setting
Room temperature for start	5 - 25 °C	16 °C
Room temperature for stop	5 - 25 °C	18 °C
Supply air temperature setpoint	10 - 40 °C	28 °C
Supply airflow	*) m3/s/Pa	**) m3/s/Pa
Extract airflow	*) m3/s/Pa	0 m3/s/Pa
Damper output	0=not activated 1= activated	0
Control output	0=IQnomic 1 =IQnomic Plus	0

*) The setting range is the same as the min/max settings of the air handling unit.
**) According to the setting for low speed at USER LEVEL under FLOW/PRESSURE.





Intermittent night-time heating with air recirculation section:

If the extract airflow is set to 0 and the damper output is not activated, the following takes place:

When conditions for start are met, outdoor air and exhaust air shut-off dampers remain closed. The damper in the air recirculation section is opened. The extract air fan is idle.

The supply air fan operates according to the preset supply airflow and the heating coil downstream of the air handling unit operates according to the supply air temperature setpoint, until the conditions for stop are met.

9.2.5 Morning BOOST

The unit is utilised to heat the premises during a preset period prior to the switch-in time set on the switch clock.

The function is used if the air recirculation section is installed.

The unit starts early and uses the same operation and temperature regulation settings as it would at the regular start time.

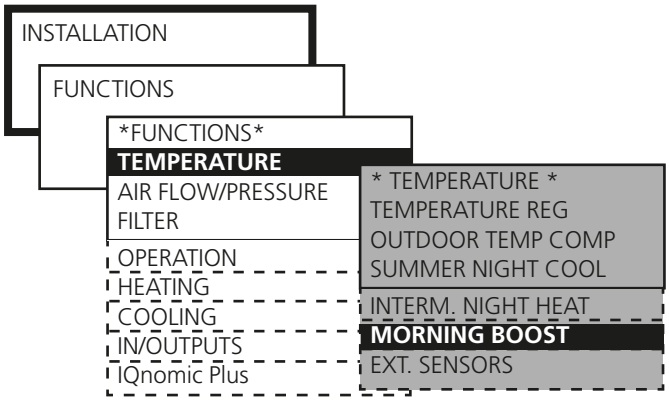
If the extract air fan is not required to operate, the extract airflow can be set to 0.

Damper output can be set to be inactive. This means that connected dampers (e.g. outdoor air and exhaust air shut-off dampers) are not affected. Normally these dampers are closed when the unit is stopped and thus they remain closed.

At the same time, the damper in the air recirculation section, if included, will open.

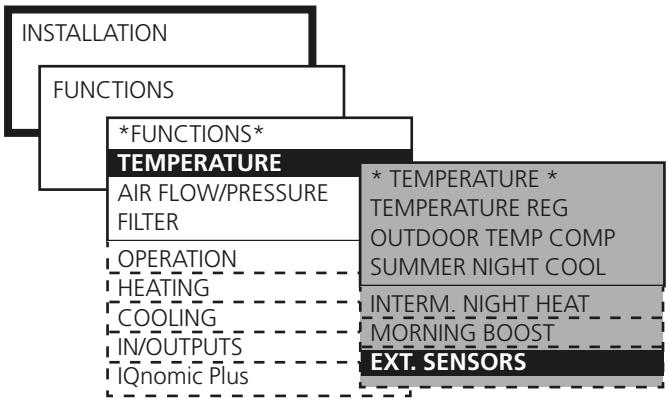
Settings:

Value	Setting range	Factory setting
Time for start prior to regular start time according to switch clock 00:00		hour, min.
Damper output	Inactive	Inactive
Extract air fan	Inactive	Inactive
FL/Rum-temp	10 - 30 °C	22 °C
TL-min	8 - 20 °C	15 °C
TL-max	16 - 50 °C	28 °C



9.2.6 External Temperature Sensors

The IQnomic control unit has provision for wiring an external room sensor and/or external outdoor sensor. The sensor can be used when the internal sensor of the unit does not provide representative values.
External Extract air/Room can measure the extract air temperature in a larger room instead of the temperature inside the air handling unit.
External Outdoor measures the outdoor air temperature outdoors, instead of the temperature inside the air handling unit.
Connect the TBLZ-1-24-2 sensor by means of the modular cable supplied, to an optional connection marked Internal BUS 1.
Sensor TBLZ-1-24-2 can be used both as a room sensor and an outdoor sensor. They must therefore be addressed according to function using the function selector switch on the sensor. The function selector switch must be in Position 1 if the sensor is used as a room sensor and in Position 2 if it is used as an outdoor sensor.
If the TBLZ-1-24-2 sensor is installed outdoors, it must be mounted inside an air-tight enclosure.
As an alternative, a temperature reading can be communicated to the air handling via communication from e.g. a main system.
The alarm setting indicates how long the alarm will be delayed if communication is lost.



Settings:

Value	Setting range	Factory setting
External Extract air/Room	Inactive//IQnomic Communication	Inactive
External Outdoor	Inactive//IQnomic Communication	Inactive
Alarms	0 - 9990 min.	5 min.

Registered design. The company reserves the right to make design changes without prior notice.

9.3 Flow/Pressure

Basic functions are set at INSTALLATION LEVEL and the values are read and set at USER LEVEL.

9.3.1 Fan Regulation

The type of regulation used for the supply air fan and the extract air fan respectively can be selected individually.

9.3.1.1 Flow Regulation

Flow regulation involves operating the air handling unit to keep the preset airflow constant. The speed of the fans is automatically regulated to provide correct airflow even if the filters begin to become clogged, air devices are blocked, etc.

Constant airflow is advantageous, since the airflow always is exactly as it was from the beginning.

It should however be noted that everything that increases the pressure drop in the ventilation system, such as the blocking of air devices and dust accumulating in the filters, causes the fans to run at a higher speed. This causes higher power consumption and may also cause discomfort in the form of noise.

9.3.1.2 Pressure Regulation

The airflow automatically varies to provide constant pressure in the ducting. This type of regulation is also called VAV regulation (Variable Air Volume).

Pressure regulation is used when damper operations increase the air volume in parts of the ventilation system.

The duct pressure is measured by an external in-duct pressure transducer which is wired to the BUS communication of the control unit. The setpoint setting required (separate for low speed and high speed) is entered in Pa.

The function can be limited so that the fan speed will not exceed the preset max. permissible values.

9.3.1.3 Demand Control

The flow demand is regulated via a 0-10 V input signal from an external sensor, such as a carbon dioxide sensor that is wired to control unit terminals 35(-) and 37(+). The required setpoint (separate for low speed and high speed) is set as a percentage of the input signal.

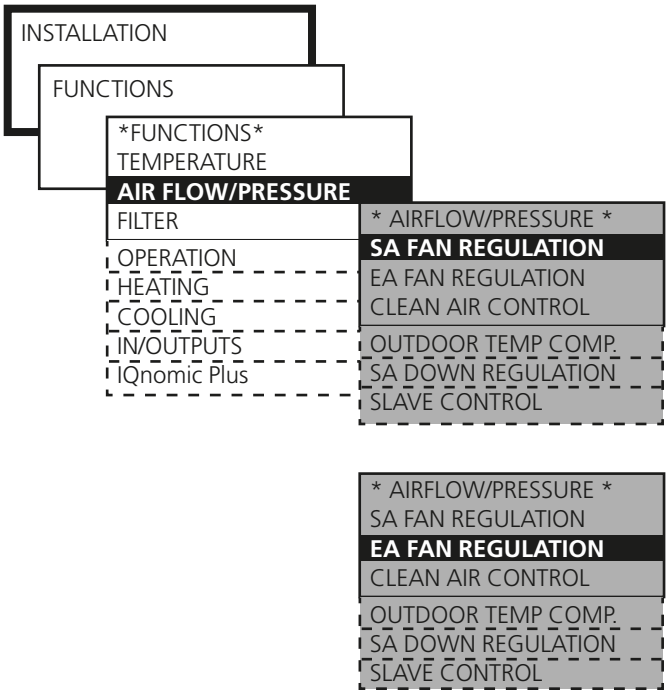
The function can be limited so that the flow will not be higher or lower than the preset max. and min. permissible values respectively.

9.3.1.4 Slave Control

The flow is constantly regulated to be the same from the one fan as from the other fan. If one fan is pressure-controlled or demand-controlled, the other one can be controlled as a slave to generate the same airflow.

The performance of the fan controlled as a slave can be restricted if its maximum flow is set to a lower airflow rate.

Both fans cannot be controlled as slaves. If both are selected by mistake, the extract air fan will be forced to operate in the flow regulation mode.



Settings:

Value	**Detting**
Fan regulation (SA/EA)	Flow regulation
	Pressure regulation
	Demand control
	Slave control

9.3.1.5 Clean Air Control

The Clean Air Control function is used in ventilation systems where the aim is to regulate the airflow according to the content of emission/impurities in the room air.

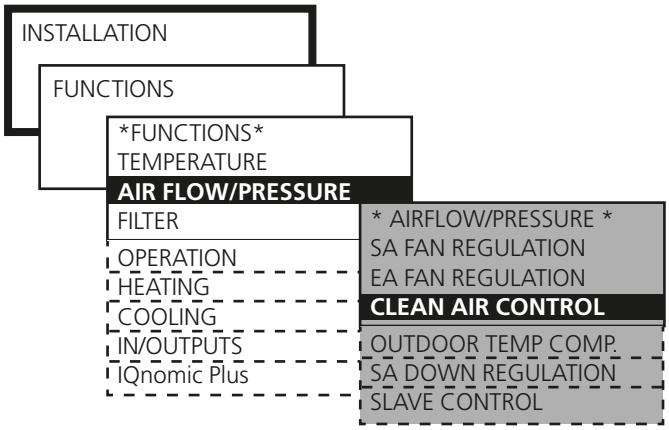
The TBLZ-1-60 VOC sensor accessory (Volatile Organic Compounds) is required. The VOC sensor measures the content of emissions/impurities in % VOC.

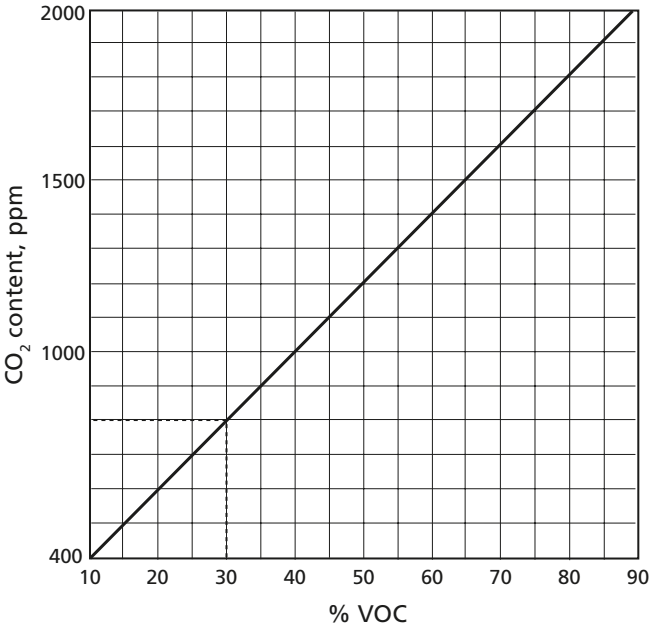
When an occupant emits CO_2, this creates a proportional amount of emissions/impurities which are measurable by the VOC sensor. For an approximate translation of the % VOC to CO_2 content, see the diagram.

When the air handling unit is energised for the first time, the VOC sensor is initialised and this involves transmitting a steady signal of approx. 50% VOC for 6 hours (applies to the VOC sensors with Part No. 328964-01. VOC sensors with Part No. 328964-02 are initiated at the factory). If the unit at a later time is de-energised, and is subsequently reenergised, the sensor is reinitialised for 15 minutes (provided that initialisation during the first energising occasion was not interrupted).

When the VOC sensor measures contents of emissions/impurities that are lower than the preset value; the air handling unit's supply air and extract air flows are then equivalent to the preset min. flows. When the VOC sensor instead measures contents of emissions/impurities that are higher than the preset value, the supply air and extract air flows are variably increased until the preset value or max. flow is reached.

When the Clean Air Control function is activated, the fan regulation modes are automatically selected (extract air fan demand controlled, supply air fan slave controlled). Later on, they can only be read under Functions in the menu.





Example:

800 ppm is equivalent to approx. 30% VOC.

If influenced by other emissions/impurities in the air, such as cooking odours, cigarette smoke, etc., the VOC content increases in relation to the CO_2 content.

Settings:

Value	Setting range	Factory setting
Clean Air Control	Inactive/Active	Inactive
VOC low speed	10 - 90 %	50 %
VOC high speed	10-90 %	30 %
Min. flow	* m3/s	0.08 m3/s
Max. flow	* m3/s	0.2/0.3 m3/s**

**)The setting range is the same as the min./max. setting of the air handling unit.*

*** Size 02 = 0.2 m3/s, Size 03 = 0.3 m3/s*

Registered design. The company reserves the right to make design changes without prior notice.

9.3.2 Outdoor Temperature Compensation

Airflow

Outdoor temperature compensation of the airflow can be activated if it is desired to reduce the airflow in the winter-time.

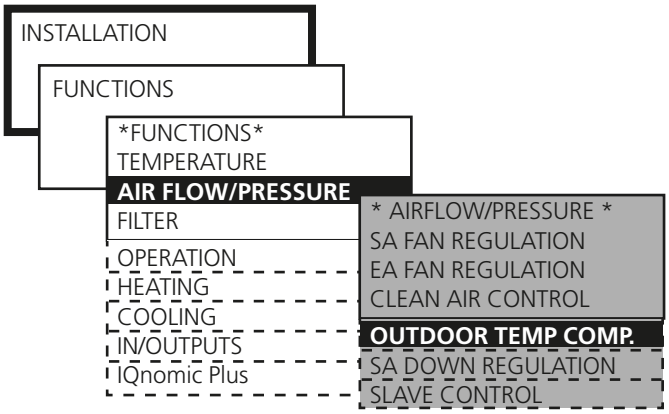
In the flow regulation mode, the current airflow is reduced. In the pressure regulation mode, the current setpoint for pressure is reduced.

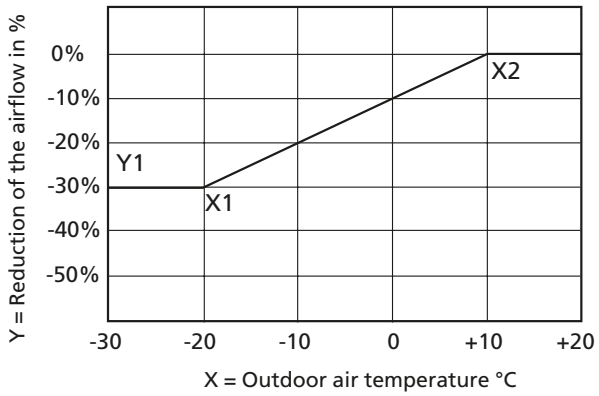
The function has no effect if the airflow is demand-controlled.

The airflow is reduced as a percentage of the current airflow/pressure.

Settings:

Value	Setting range	Factory setting
Y1, max permissible reduction	0-50%	30 %
X1, breakpoint	-30 – -10 °C	-20 °C
X2, breakpoint	-10 – +15 °C	+10 °C





Outdoor air compensation according to factory settings involves:

Outdoor temperature +10 °C (Breakpoint X2): Compensation starts and gradually proceeds between 0–30 % down to outdoor air temperature -20 °C.

Outdoor air temperature -20 °C (Breakpoint X1): Constant compensation proceeds at 30 % (max reduction Y1).

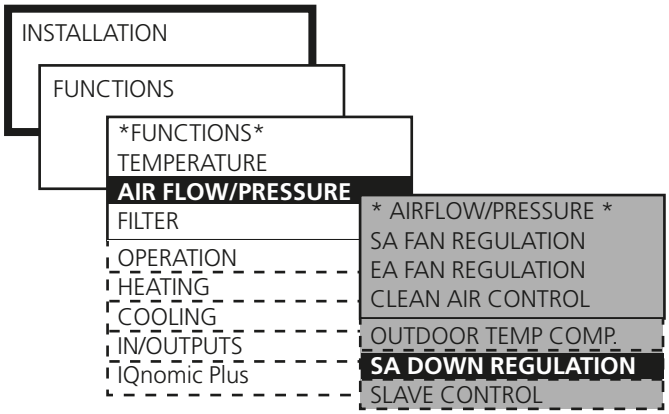
9.3.3 Downspeed Control of Fan Speed to Min. Set Point, Airflow/pressure

Regulation of the supply airflow to a lower flow rate is the last step in the regulation sequence on increasing heating load for ERS regulation or supply air regulation. The extract air fan cannot be selected alone; only the supply air fan or both the supply air and extract air fans can be selected.

See Section 9.2 as well.

An adjustable temperature decrease allows a lower supply air temperature setpoint, before down regulation begins.

This neutral zone can be set on line NZ SA DOWN REGULATION in the appropriate menu.



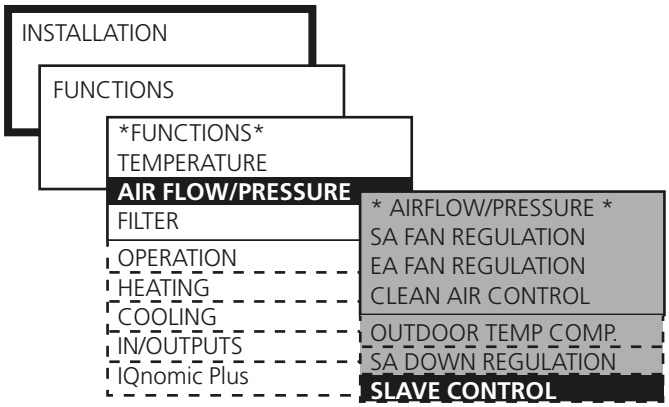
Settings:

Value	Setting range	Factory settings
Function	Inactive/SA/SA+EA	Active
Neutral zone	0.0-10.0 °C	0.0 °C

9.3.4 To adjust the flow of the slave fan

It is possible to preset the set point of the slave fan to provide a higher or lower airflow than the current airflow of the controlling fan.

The deviation from the airflow of the controlling fan can be preset by entering a COP. A cooling COP of 0.5 denotes that the airflow of the slave will be 50% of the master fan's airflow.

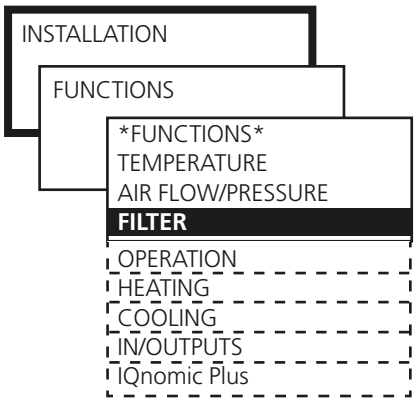


Settings:

Value	Setting range	Factory settings
Cooling COP	0.5-1.5	1,0

9.4 To Activate the GOLD SD Filter Monitoring Function

The filter monitoring function must be activated for the filters that are to be monitored.



Settings:

Value	Setting range	Factory settings
Standard filter	Inactive/SA/EA SA+EA	SA+EA
Prefilter	Inactive/SA/EA SA+EA	SA+EA

Registered design. The company reserves the right to make design changes without prior notice.

9.5 Operation

9.5.1 Switch clock

Basic functions are set at INSTALLATION LEVEL and the values are read and set at USER LEVEL.

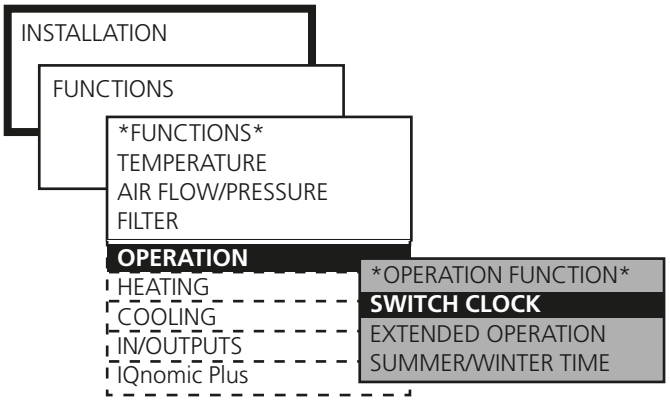
The switch clock controls the operating times of the unit. The following two basic functions can be set:

LOW SPEED – HIGH SPEED
Low speed is the basic level and times for high speed operation are set at USER LEVEL under SWITCH CLOCK.

STOP – LOW SPEED – HIGH SPEED
Stop is basic level and times for low speed and high speed operation are set at USER LEVEL under SWITCH CLOCK.

Settings:

Value	Setting range	Factory settings
Function	Low speed/High speed Stop/Low speed/High speed	Low speed/High speed



9.5.2 Extended Operation

The inputs for external low speed and external high speed respectively, can be supplemented with extended operation. They can be used for overtime running activated by a pushbutton, for example.

Desired time in hours and minutes can be set as follows.

Settings:

Value	Setting range	Factory settings
External low speed	0:00 - 23:59	0:00
External high speed	0:00 - 23:59	0:05
	(hour:min)	(hour:min)

9.5.3 Summer time/Winter time

The time and date readings include factory-preset automatic changeover from summer time to normal time and vice versa, thus conforming to EU standard (the last Sunday in March and the last Sunday in October respectively).

This automatic changeover can be blocked and set as inactive.

Settings:

Value	Setting range	Factory settings
Summer time/Winter time	Inactive/active	Active

9.6 Heating

9.6.1 Heat exchanger

8.6.1.1 Defrosting the rotary heat exchanger

In environments where the extract air can occasionally be humid, the defrosting function can be activated to protect the heat exchanger from frosting. The function continuously monitors the condition of the heat exchanger rotor to prevent condensate from freezing in the rotor passages and clogging them.

The function requires a separate pressure transducer (preset for heat exchanger defrosting) wired to the control unit inputs for external BUS communication and connected by hoses to the pressure measuring tappings of the unit.

See special installation instruction for the TBLZ-1-23-aa Pressure sensor.

The pressure drop across the rotor must then be calibrated to establish a reference pressure drop for monitoring purposes. See 7.4.3 Calibration - Heat exchanger.

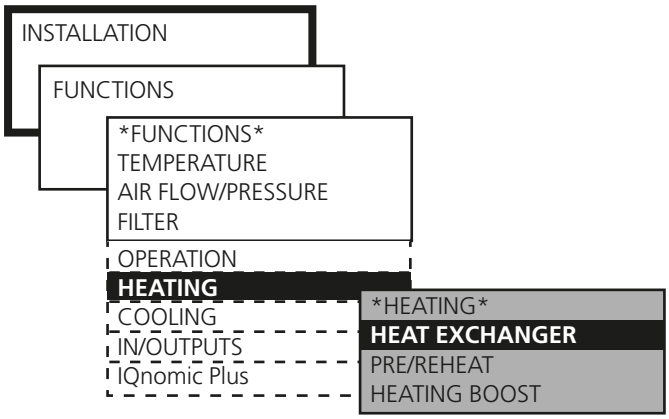
When the function is activated the pressure drop across the heat exchanger is continuously measured and the value is compared with the calibration value. If the pressure drop exceeds the preset limit value, a defrosting sequence is implemented where the rotor speed is gradually ramped down (ramp time of max. 4 minutes) to the speed at which the pressure drop across the heat exchanger has decreased to half of the preset limit value. The rotor speed can be 0.5 rpm but not slower. During the defrosting operation, warm extract air thaws any possible ice coating. A time delay of 4 minutes gives the heat exchanger a chance to dry, before the rotor once again is ramped up (ramp time max. 4 minutes) to its ordinary speed.

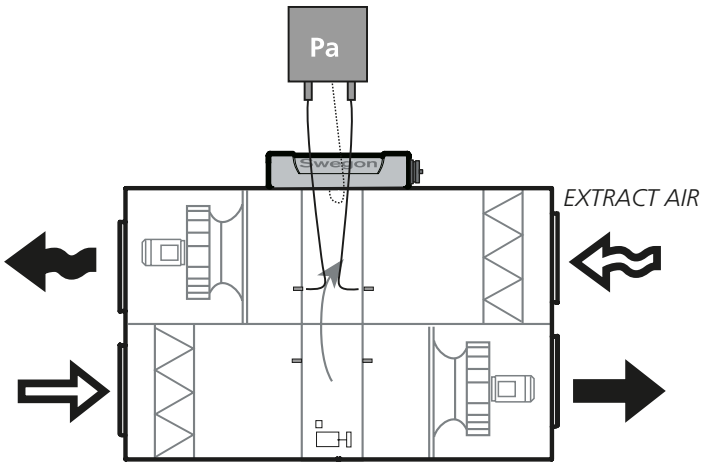
The max. duration of the defrosting operation is 30 minutes. If the pressure drop has not decreased within this max. duration on six occasions during a 24-hour period, an alarm is tripped.

Note that the heat exchanger performs less efficiently while defrosting is in progress and that the supply air temperature will decrease downstream of the heat exchanger.

Settings:

Value	Setting range	Factory settings
Defrosting	Inactive/active	Inactive

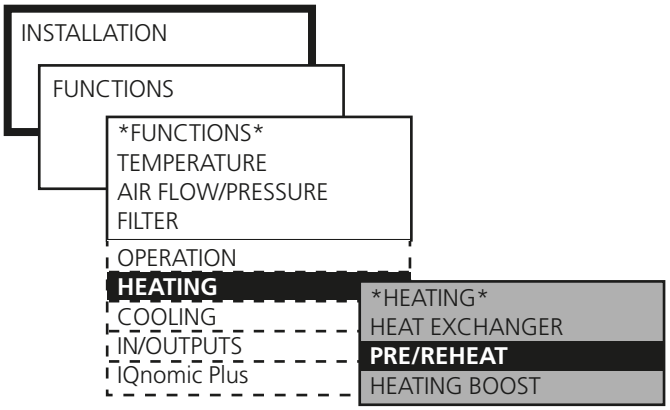




Defrosting function with separate pressure transducers, in principle

Registered design. The company reserves the right to make design changes without prior notice.

9.6.2 Pre-/Reheating



AIR HEATER FOR HOT WATER

On selecting the exercising pump or pump+valve function, the selected relay output will be activated if reheating is needed and this starts the circulation pump of the air heater.

If the outdoor temperature is low (colder than +12 °C), the pump output contact is continuously activated. During other times, the pump output contact is activated 2 min/24 hours for exercising of circulation pump.

ELECTRIC AIR HEATER

If "pump exercising mode inactive" has been selected, the relay output is activated whenever heating is required.

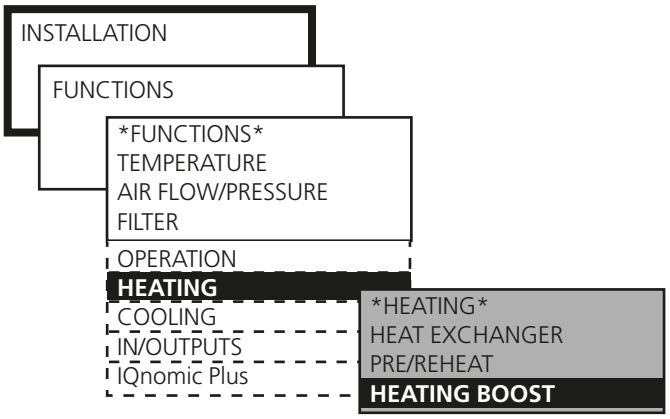
The relay output can be used for indicating or blocking the external function.

EXERCISING MODE

Settings:

Value	Setting range	Factory settings
Function	Inactive/pump/ pump+valve/ valve	Pump
Exercise period	1 – 60 min.	3 min.
Interval	1 – 168 hrs.	24 hrs.

9.6.3 Heating BOOST



Heating boost means that the air handling unit, operating in the normal flow regulation mode, increases both the supply airflow and the extract airflow in order to carry more heat into the premises.

The fans are allowed to work in the range between current flows (low speed, high speed) and preset max speed flow.

The function only works if the air handling unit is operating in the extract air regulation mode. If demand control or boost is selected in combination with heating boost, the flow is controlled by the function that transmits the highest output signal to the fans.

This function cannot be combined with pressure regulation.

The flow increase starts steplessly when there is a difference of 2-10°C (3°C is factory preset) to preset max supply air temperature. When max supply air temperature has been reached, the unit runs at preset max flow (For particulars of how to set the max flow, see Section 7.2.2).

Settings:

Value	Setting range	Factory settings
Heating BOOST	Inactive/active	Inactive
Start limit	2-10 °C	3 °C

9.7 Cooling

Control of cooling units is primarily wired to Outp.1 or Outp. 2. If none of these outputs are vacant, connect the control means to the IQnomic Plus module. The module's function selector switch must be set to Position 6.

9.7.1 Operation

Activate the cooling function.

9.7.2 Cooling Regulation (Control)

Stepless 0-10 V DC
Used when variable cooling control is connected. The COMPACT air handling unit's cooling controller modulates a 0-10 V DC signal that is linear with the cooling load. Connect to the IQnomic Plus module, terminals 15-16.

Both the cooling relays of the air handling unit operate in parallel with the signal and are energised when the cooling signal exceeds 0.5 V DC and are de-energised when the signal drops below 0.2 V DC.

The output for Cooling Relay 1 is connected to IQnomic Plus terminals 1-2 and for Cooling Relay 2 to terminals 4-5.

Stepless 10-0 V DC
Same as above, but the control signal is inverted where a 10 V output signal means a 0 % cooling load.

On/off, 1 step
Used if cooling in one step is connected. Connect to the IQnomic Plus module, Cooling relay 1, terminals 1-2. The cooling controller of the air handling unit regulates the cooling load at 1-100%. Cooling relays 1 and 2 are energised when the cooling load exceeds 5 % and are de-energised when the cooling load is less than 2 %.

The 0-10 V DC control signal output operates in parallel with the 0-100 % cooling demand and can be used for indicating the cooling demand, for instance. Connect to the IQnomic Plus module, terminals 15-16.

On/off, 2 steps
Used when cooling in 2 steps is connected. Connect to the IQnomic Plus module, Cooling relay 1, terminals 1-2, and Cooling relay 2, terminals 4-5. The cooling controller of the unit regulates the cooling demand at 0-100 %.

Cooling relay 1 is energised when the cooling load exceeds 5 % and is de-energised when the cooling load is less than 2 %. Cooling relay 2 is energised when the cooling load exceeds 55 % and is de-energised when the cooling load is less than 50 %.

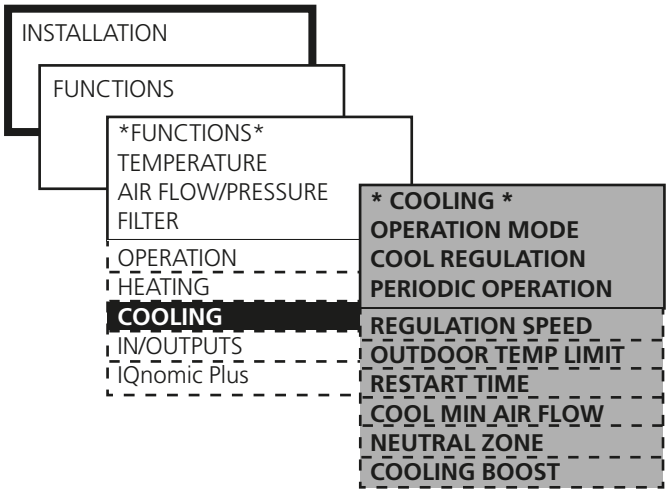
The 0-10 V DC control signal output operates in parallel with the 0-100 % cooling demand and can be used for indicating the cooling demand, for instance. Connect to the IQnomic Plus module, terminals 15-16.

On/off, 3 Steps - Binary
Used when cooling with two inputs controlled with three binary steps is connected. Connect to the IQnomic Plus module, Cooling relay 1, terminals 1-2, and Cooling relay 2, terminals 4-5. The cooling controller of the unit regulates the cooling demand at 0-100 %..

On an increasing cooling load:
Cooling relay 1 is energised when the cooling load is above 5 % and is de-energised when the cooling load is between 40-70 %. Cooling relay 2 is energised when the cooling load is above 40 %. Cooling relay 1 is energised again (together with cooling relay 2) when the cooling load is above 70%.

On a decreasing cooling load:
Cooling relay 1 is deenergised when cooling load is below 60 %, it is energised again when cooling load is below 30 % and is deenergised again when cooling load is below 2 %. Cooling relay 2 drops when cooling load is below 30 %.

The 0-10 V DC control signal output operates in parallel with the 0-100 % cooling demand and can be used for indicating the cooling demand, for instance. Connect to the IQnomic Plus module, terminals 15-16.



On a decreasing cooling load:
Cooling relay 1 drops when cooling load is below 60 %, it is energised again when cooling load is below 30 % and drops again when cooling load is below 2 %. Cooling relay 2 drops when cooling load is below 30 %.

The output for 0-10 V DC control signals (terminals 42-43) operates in parallel with the 0-100 % cooling load and can be used for indicating the cooling demand, for instance.

Settings for cooling functions on this page and the next:

Value	**Setting range**	**Factory settings**
Operation mode	Inactive/active	Inactive
Cooling regulation	Stepless 0-10 V Stepless10-0 V On/Off 1 step On/Off 2 step On/Off 3 step binary	On/Off 1 step
Periodic operation		
Cooling relay 1	Inactive/pump/ pump+valve/valve	Inactive
Cooling relay 2	Inactive/pump/ pump+valve/ valve	Inactive
	Exercise period	1 – 60 min.
	3 min.	
Interval	1 – 168 hrs.	24 hrs.
Regulation speed between steps	0-600 sec	300 sec
Outdoor temperature limit		
Step 1	0-25 °C	3 °C
Step 2	0-25 °C	5 °C
Step 3	0-25 °C	7 °C
Restart time	0-900 sec	480 sec
Cooling min air flow		
Supply air	0-Max flow	–
Extract air	0-Max flow	–
Neutral zone	0-10 °C	2.0 °C
Cooling BOOST	Inactive Comfort Economy Sequence Comfort+economy Economy+ sequence	Inactive
Start limit in connection to min supply air temp	2-10 °C	3 °C

Registered design. The company reserves the right to make design changes without prior notice.

See preceding page for possibilities of setting.

9.7.3 Periodic Operation

Can be selected to run pumps if cooling relay 1 and/or 2 are used.

The exercising mode can be selected for "pump, pump + valve" or "valve" only (0 - 10 V output). The pumps are exercised 2 minutes per day if this is activated.

9.7.4 Regulation Speed

The required delay period between the various cooling steps can be set.

This is done so that a compressor, for instance, will have time generate required cooling capacity before the next cooling step is switched in.

This applies to changeover from step 1 to step 2 and from step 2 to step 3; and only on an increasing cooling load.

9.7.5 Outdoor Temperature Limit

Provision is available for setting an outdoor temperature-related blocking function in 3 steps. If the outdoor temperature is below each step limit, the function of the cooling relays will be blocked.

This function also restricts the 0-10 V output signal to transmission in steps.

Step 1 maximises the output signal to 2.5 V, step 2 to 5.0 V and step 3 to 7.5 V.

9.7.6 Restart Time

The time should be set in such a way that it follows the recommendations of the cooling machine supplier for the number of starts per hour.

The restart time is calculated from the time when a relay is energised to when it is allowed to be energised again.

The 0-10 V signal is delayed during the same period.

9.7.7 Cooling Min Air Flow

In order for the cooling function to operate the supply air and extract air airflows must be greater than their respective limit values (preset at USER LEVEL under FLOW/PRESSURE).

The cooling min flow function can be blocked by setting both flow limits to 0.

9.7.8 Neutral Zone

The neutral zone prevents the cooling and heating systems from counteracting each other.

Preset neutral zone is added to the setpoint for heating and the sum of these provides the setpoint for cooling.

9.7.9 Cooling BOOST

Cooling BOOST means that the supply air and extract air airflows are increased to convey more cooling energy to the premises.

Cooling BOOST cannot be combined with pressure regulation.

The flow increase takes place between current flow and preset max flow.

The function can be selected in five variants as follows:

Comfort

The cooling outputs are activated if there is a cooling load.

When the cooling function is active and the temperature in the supply air drops toward the preset SA min temperature, the flow will steplessly increase.

The GOLD runs at preset max flow when the supply air temperature is same as the min. temperature.

Economy

Cooling BOOST Economy first uses a higher airflow to cool the premises, before a start signal is transmitted to the cooling machines.

The function can also operate without the cooling function being activated.

On a cooling load, the flows are slowly increased up to preset maximum flow. When the flows are up to max and if a cooing load is still present, the output contacts for cooling are activated.

The cooling boost function requires an outdoor air temperature of at least 2 °C lower than the extract air temperature for it to be activated. Normal cooling operation is activated if the temperature difference is too small.

Sequence

The cooling BOOST Sequence is used if a cooling machine is sized for a higher than normal cooling flow.

If there is a cooling load, the flow is increased up to the preset max flow before the cooling function is activated. The cooling function is delayed 1 minute after the airflow is increased.

The cooling boost sequence is blocked if no cooling function has been selected.

Comfort + Economy

Cooling BOOST Comfort + Economy is a combination of the two variants for increasing the airflow.

If the conditions for Cooling BOOST Economy are met, the unit will begin increasing the airflow before the cooling unit starts up.

If the conditions for outdoor air are not met, the flow increase will begin when the supply air temperature reaches the preset Min. permissible temperature.

Economy + Sequence

Cooling BOOST Economy + Sequence is a combination of the two variants for increasing the airflow.

If the conditions for Cooling BOOST Economy are met, the unit will begin increasing the airflow before the cooling unit starts up.

If the conditions for outdoor air are not met, the unit will begin increasing the airflow when the cooling unit starts up.

9.8 Input/output connections

Outputs
The control unit has two relay-controlled outputs, terminals 1-2 and 3-4.

They must be individually set to the function they are to have.

Important! A maximum of two of the functions below can be combined.

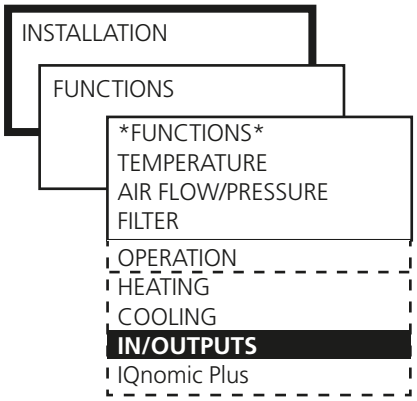
Optional functions:
- Damper, output: For control of the outdoor air/exhaust air damper
- Operation, output: For indicating unit in operation.
- Low speed, output: For indicating low speed operation.
- High speed, output: For indicating high speed operation.
- A Alarm, output: For group alarm A.
- B Alarm, output: For group alarm B.
- Heating, output: For indicating that the reheater is operating.
- Cooling, output 1: For controlling external cooling.
- Cooling, output 2: For controlling external cooling.

Inputs
The control unit has two digital outputs, terminals 5-6 and 7-8.

They must be individually set to the function they are to have.

Important! A maximum of two of the functions below can be combined.

Optional functions:
– External stop. The unit will stop if the input is not closed.
– External LS: For external overtime operation via timer (switch clock), from stop to low speed operation.
– External HS: For external overtime operation via timer (switch clock), from stop or low speed operation to high speed operation.
– External Alarm 1: For connection of External Alarm 1.
– External Alarm 2: For connection of External Alarm 2.
– External reset: For connection of pushbutton for resetting a tripped alarm.
External fire alarm: A fire alarm will trip if the input is not connected.

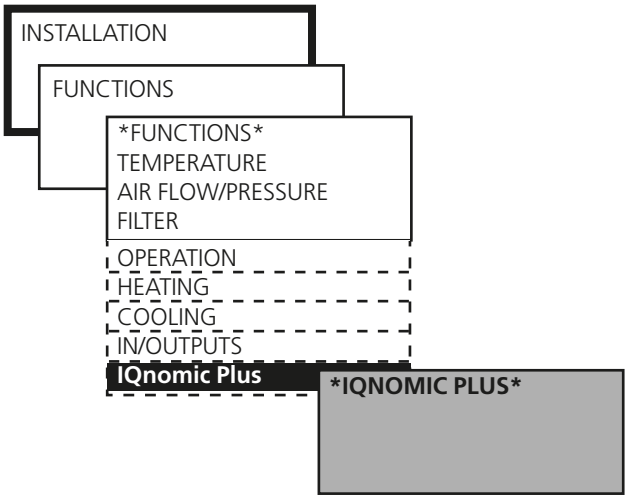


Registered design. The company reserves the right to make design changes without prior notice.

9.9 IQnomic Plus

IQnomic Plus is a name given to additional modules for extra control functions.

See special instructions.



10 AUTOMATIC FUNCTIONS

10.1 General

The COMPACT has a number of automatic functions. The operation of the unit is influenced when certain functions are activated.

10.1.1 Starting Sequence

The COMPACT has a starting sequence with factory-preset time delay between every step as follows:

1. The damper relay is energised and opens the shut-off damper (if installed).

Time delay: 30 seconds.

2. The extract air fan starts and the heat exchanger is controlled to provide max. heat recovery. Additional heating (if installed) is activated to generate 40% of its max capacity.

Time delay: 90 seconds.

3. The supply air fan starts.

Time delay: 180 seconds (from the time when the extract air fan has started).

4. The temperature regulation function begins according to its regular settings.

The starting sequence prevents the extract air fan from starting if the shut-off damper is closed. By starting the extract air fan first, and the heat exchanger as well, the system also avoids chilling the premises with cool supply air under cold weather conditions.

10.1.2 Cooling Recovery

Cooling energy recovery is an automatic function that helps the air handling unit utilize the relative "cooling energy" that may be present indoors if cooling is required and the outdoor temperature is high.

The heat exchanger rotates at max. speed and in this way recovers the relative cooling energy or chilliness in the extract air.

The conditions for this function to be activated are that there is a cooling demand and that the outdoor temperature is 1 °C higher than the extract air. The function is switched out when the cooling load ceases to exist or when the outdoor temperature is the same as that of the extract air.

The text COOLING RECOVERY is shown in the hand-held micro terminal.

10.1.3 Zero Point Calibration

The pressure transducer of the unit is automatically calibrated. This calibration is carried out 3 minutes after the unit has been stopped.

The text ZERO PT CALIBR is shown in the hand-held micro terminal.

The fans cannot start while calibration is in progress.

10.1.4 Anti-frost Monitoring Function – Air Heater for Hot Water

The anti frost monitoring function is always active if the air heater for hot water connected has been supplied by Swegon.

The function activates a heating device that maintains 13 °C in the coil while the air handling unit is in operation and 25 °C in the coil when the unit is stopped. An alarm is initiated and the unit is stopped if the temperature sensor senses a temperature below 7 °C.

10.1.5 Additional cooling – Electric Air Heater

The fans continue to operate at min speed for 3 minutes after the air handling unit has been stopped to cool the electric heating elements if the electric air heater has been operating.

The text ADD COOLING appears in the hand-held micro terminal.

10.1.6 Additional running - Heat Exchanger

The rotary heat exchanger automatically continues to rotate ca 1 minute after the air handling unit has been stopped.

It takes a little time for the fans to stop rotating after a stop order has been entered in the micro terminal. This prevents the admission of cool supply air into the premises.

10.1.7 Density-corrected Airflow

The density of the air is different at different temperatures. This means that a specific volume of air will change at different air densities.

The COMPACT automatically corrects this, so that correct air volume is always obtained.

The control equipment always shows the corrected airflow.

Registered design. The company reserves the right to make design changes without prior notice.

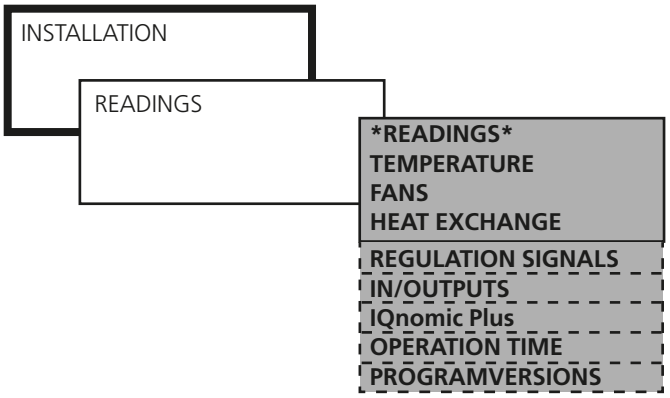
11 READINGS

The operating status and the values can be read. Used for performance checks and for generally checking values, settings, power consumption, etc.

No values can be altered in this menu group.

Each menu indicates which values can be read.

The operation times per 24 hour period are given under the OPERATION TIME menu.



12 MANUAL TEST

⚠ Note! Manual test running can cause indoor comfort problems. There is also risk of overloading the system. The responsibility for discomfort and overload rests totally on the person who activates the function.

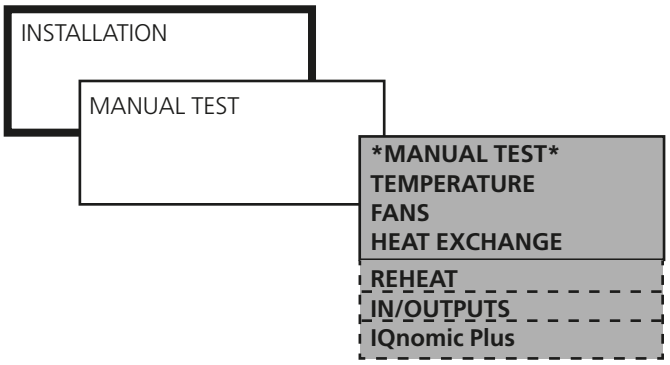
Manual test run can take place for testing the inputs and outputs, fans and heat exchanger, etc.

Used when the air handling unit is first installed to make sure that all the connections have been correctly wired.

Most alarms, functions and normal control modes will be blocked while manual testing is in progress.

On a return to the other menu groups, the controller resumes normal operation and all settings for manual testing will be terminated.

Each menu indicates which functions can be test run.



13 ALARM SETTINGS

13.1 Fire Alarms

EXTERNAL FIRE ALARM
The Inp. 1 and Inp. 2 inputs can be used for external fire protection equipment The resetting of alarms can be selected to occur manually or automatically.

INTERNAL FIRE ALARM
The air handling unit's internal temperature sensors serve as fire protection thermostats. An alarm is initiated if the supply air temperature sensor registers more than 70 °C or when the extract air temperature sensor registers more than 50 °C.
If an external Extract air/Room temperature sensor is connected and activated, this works parallel with the extract air temperature sensor of the unit.

FANS IN THE EVENT OF A FIRE
The fans in the air handling unit can be used for evacuating gases, etc.
The activated function works together with the External fire/smoke function or Internal fire alarm.
If the air handling unit is idle, the pre-selected fans will start up regardless of whether External Stop or Manual Stop has been activated in the hand-held micro terminal.
The damper relay in the air handling unit is energised and the operating relay drops.
The dampers pre-selected for service in the event of a fire, should be wired to the damper relay and these dampers will open. The dampers that are meant to close in the event of a fire, should be wired to the in-operation relay and these dampers will close.

FAN SPEED IN THE EVENT OF FIRE
Will be activated automatically if the fans have been activated in event of fire (see above), and make it possible to restrict the max speed of the fans.

Settings:

Value	Setting range	Factory setting
Internal fire alarm	0=inactive 1=activated	0
External fire alarm	auto/manual	manual
Fan in event of fire	Inactive/EA/SA/ SA+EA	Inactive
Fan speed in event of fire, SA	10-100%	100%
Fan speed in event of fire, EA	10-100%	100%

13.2 External Alarms

EXTERNAL ALARMS 1 and 2
Input Inp. 1 and Inp. 2 can be used for external alarms (can be selected under Inputs/Outputs).

Typical uses:
– Motor protection for the circulation pump in the heating or cooling circuit.
– Service alarm actuated by smoke detectors.
Set the time delay and set whether the alarm shall be activated on closure or disconnection of the input.

Settings:

Value	Setting range	Factory settings
Time delay	1-600 sec	10 sec
Alarm at closure	1=closure 0=disconnection	1
Alarm reset	0=auto/1=man	0

INSTALLATION
ALARM SET
ALARM SETTINGS
FIRE ALARM
EXTERNAL ALARMS
ALARM LIMITS
ALARM PRIORITY

13.3 Alarm Limits

Changes in the factory-preset alarm limits should only be made if you have special reasons for doing so and you should be aware of the consequences.

TEMPERATURE
DEVIATION SA-TEMP (deviating supply air temperature) indicates how much the supply air temperature is allowed to be below the supply air temperature setpoint before an alarm is initiated.

MIN EA-TEMP (min extract air temperature) indicates how low the extract air temperature is allowed to be before alarm is initiated.

FILTERS
SUPPLY AIR/EXTRACT AIR indicates at which level of contamination in the supply air filter that an alarm will trip.

HEAT EXCHANGER
ALARM LIMIT indicates at which pressure rise an alarm will trip, if there is an extra installed pressure transducer for the defrosting function of the heat exchanger.

SERVICE PERIOD
SERVICE PERIOD indicates the period until the next service.

Settings:

Value	Setting range	Factory settings
TEMPERATURE		
Deviating supply air temp.	2-15 °C	5 °C
Min extract air temp.	8-20 °C	15 °C
FILTERS		
Supply air	50-300 Pa/ 5-20%*	100 Pa/ 10%*
Extract air	50-300 Pa/ 5-20%*	100 Pa/ 10%*
Supply air, prefilter.	50-300 Pa	100 Pa
Extract air, prefilter.	50-300 Pa	100 Pa
HEAT EXCHANGER		
Alarm limit	30-100	Pa 50 Pa
SERVICE PERIOD		
Alarm limit	0-99 months	12 months

**Depending on the choice of monitor function.*

13.4 Alarm Priority

There should be special reasons for alteration of alarm priority and you should be aware of the consequences.

Changes in priority should only be made if you have special reasons for doing so and you should be aware of the consequences. The priority of certain alarms cannot be changed.

Settings:

See 18.2 Alarm Descriptions.

Registered design. The company reserves the right to make design changes without prior notice.

14 HAND-HELD TERMINAL

14.1 Language

The language desired can be set here. Normally this setting is entered when the air handling unit is started for the first time and the question ÄNDRA/CHANGE? automatically appears in the hand-held terminal.

However, the language setting can be changed at any time.

Settings:

Value	Setting range	Factory settings
Language	Current languages is listed in the menu.	English

14.2 Air flow unit

The air flow unit desired can be set here.

Settings:

Value	Setting range	Factory settings
Flow unit	l/s m3/s m3/h	m3/s

14.3 Min/Max Adjustment

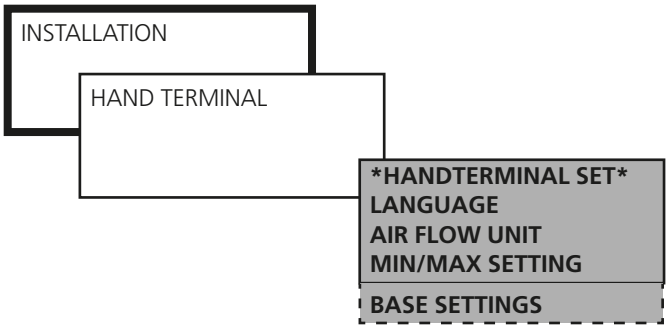
Used for restricting the setting range at user level for setpoints as well as for min. and max. temperature limits.

Settings:

Value	Setting range	Factory settings
For EA and SA regulation		
Setpoint, min	10-30°C	15°C
Setpoint, max	10-40°C	40°C
For EA regulation		
Min SA, min	8-20°C	13°C
Max SA, min	8-20°C	18°C
Min SA, max	16-50°C	25°C
Max SA, max	16-50°C	45°C
For ERS regulation 1		
Breakpoint, min	12-26°C	15°C
Breakpoint, max	12-26°C	23°C
EA/SA Diff, min	1-7°C	1°C
EA/SA Diff, max	1-7°C	5°C

EA = Extract air
SA = Supply air

ERS= Extract air temperature-related supply air temperature-regulation



14.4 Base Settings

Used for saving and resetting the settings.

BASE SETTINGS 1 and 2 are two levels where the user him-/herself saves current settings and activates them when needed.

The two base settings can be used as a summer setting and as a winter setting of the air handling unit.

The values in INITIAL SETTING 1 and 2 saved in the internal memory can be transferred to the external MMC memory by entering SAVE SETTINGS. EXTERNAL MEMORY.

The values can be transferred from the external MMC memory to the internal memory by entering FETCH EXTERNAL MEMORY.

INITIAL SETTING 1 and 2 must be downloaded into the control unit by entering INTERNAL MEMORY, LOAD NEW SETTINGS.

Under SAVE EXTERNAL MEMORY, there is a function that can save current settings to the MMC memory.

Current settings can be stored directly in the control unit under FETCH EXTERNAL MEMORY

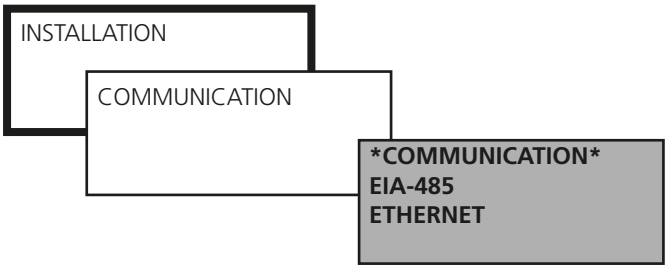
FACTORY SETTINGS resets the air handling unit's settings to the original values it had when it was supplied (See 21.2 Commissioning Record).

The preset values for communication and alarm priority are not reset if the factory settings are reinstated.

Settings:

Value	Setting range
Save/fetch setting	
Save setting – internal memory	Save new setting 1
	Save new setting 2
external memory	Save setting 1
	Save setting 2
	Save current setting
	Save all
Load/fetch – internal memory	Load new setting 1
	Load new setting 2
external memory	Fetch setting 1
	Fetch setting 2
	Fetch current setting
	Fetch all
Factory setting	Activate

15 COMMUNICATION



Provision for communication and supervision is integrated as standard into the COMPACT. The unit is ready to be connected via EIA-485 and Ethernet. For particulars of connecting and wiring the air handling unit, see Section 20.3.2 Wiring to Terminals.

Communication can also be established via Ethernet without software other than an ordinary web browser such as Internet Explorer.

Further information about interfaces, protocol and configuration is available at www.swegon.se (com) under Products/Air handling units/COMPACT air handling units/Documentation.

15.1 EIA-485

Protocol and settings for EIA-485 is specified.

Settings:

Value	Setting range
Modbus RTU	Address, speed, parity, stop bits
Metasys N2 OPEN	
Lon Works	
Exolinc	

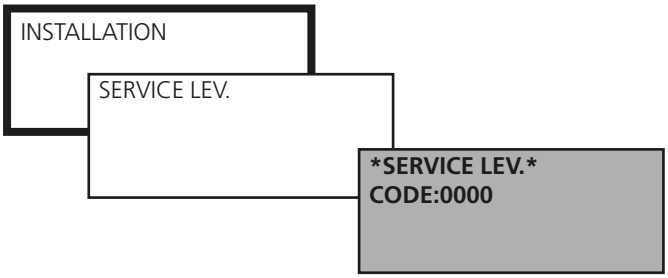
15.2 Ethernet

Protocol and settings for Ethernet is specified.

Settings:

Value	Setting range
Ethernet	MAC ID DHCP SERVER (active or inactive) IP ADDRESS (static or dynamic) SUBNETM. GATEWAY DNS-SERVER MODBUS TCP CLIENT (IP address, netmask and port number) BACNet IP (active or inactive, Device ID, Port no.)

16 SERVICE LEVEL



A code and special training are required for access to this menu group.

Registered design. The company reserves the right to make design changes without prior notice.

17 MAINTENANCE

Warning

Before carrying out any work, make sure that the power supply to the unit has been isolated.

17.1 Filter Change

The filters should be changed when the filter alarm has been activated.

Order new filters from Swegon or its representative!

State the size of the air handling unit and whether the change involves one or two air directions.

17.1.1 To remove the Filters

Pull out the handles to free the filters from the filter holder. Withdraw the filters.

It is advisable to clean inside the filter space while the filters are gone.

17.1.2 To fit new filters

Insert the filters into the filter holder.

Insert the filters as far as possible into the unit and press lightly on the filter frames, so that they will fit tightly.

Push in the handles so that the filters are clamped in place in the filter holder.

Carry out a filter calibration as described in Section 7.4.2.

17.2 Cleaning and Inspection

17.2.1 General

Clean the interior of the air handling unit as the need arises.

Inspect the air handling unit thoroughly at the same time that you replace the filters or at least twice a year.

17.2.2 Filter Space

Cleaning is most appropriate when you change the filters.

17.2.3 Heat exchangers

Check at least twice a year whether cleaning is necessary.

The cleaning work is carried out from the filter space.

The heat exchanger should preferably be cleaned by vacuum cleaning with a soft nozzle to prevent damaging the air passages in the rotor.

Turn the rotor by hand to enable you to vacuum clean its entire surface.

If the heat exchanger is substantially fouled, it can be blown clean with compressed air.

If necessary, the heat exchanger can be withdrawn from the unit casing and washed with degreasing solvent. Only service personnel trained by Swegon shall be permitted to use this cleaning method.

FABRIC SEAL

Lift up the fabric seal and inspect its underside. Clean if needed by brushing or vacuum cleaning.

If the fabric seal is worn or substantially fouled, it should be replaced. Do not lubricate it!

BELT TENSION

Replace the drive belt if it feels loose or worn and slightly slips if it meets resistance. Contact service personnel trained by Swegon!

17.2.4 Fans and Fan Space

Inspect and clean the fan impellers to remove possible dirt deposits.

Check the impeller to make sure that it is not out of balance.

Clean or brush off the fan motor. It can also be cleaned by carefully wiping it with a damp cloth that has been dipped in a solution of water and dishwashing detergent.

Clean the fan space, if needed.

17.3 Performance Checks

General performance checks should be carried out in conjunction with filter change or at least once a year.

It is then appropriate to compare the current performance values of the unit with the Commissioning Record. Eventual deviations should be remedied.

18 ALARMS AND FAULT TRACING

18.1 General

Alarms are indicated by an alarm text and flashing LED in the hand-held micro terminal.

Fire alarms and frost alarms are shown in all the menu images. Other alarms are only shown if you are in the Main menu.

Active, but time-delayed alarms can be viewed quickly at USER LEVEL under ALARMS. The 10 most recently initiated alarms can also be read in this menu.

A fault can be traced by examining the function or function section indicated in the alarm text.

Faults can also be traced via the READINGS menu or the MANUAL TEST menu at Installation level.

If the fault cannot immediately be remedied:

Consider whether the air handling unit can continue to operate until the fault has been remedied. Choose to block the alarm and/or to change it from STOP to OPERATION (See Section 12, Alarm settings).

18.1.1 A and B Alarms

For particulars of type A alarm indication to output for Alarm Relay A (Inp. 1 and Inp. 2), see also 9.8.

For particulars of type B alarm indication to output for Alarm Relay B (Inp. 1 and Inp. 2), see also 9.8.

From these terminals, alarms can be forwarded with different priority.

18.1.2 Resetting of alarms

Alarms that require manual resetting can be reset from the hand-held micro terminal. Select RESET in the current alarm menu.

Alarms that reset themselves automatically do so as soon as the fault has been remedied.

Alarms can also be reset via a communication network.

18.1.3 Changing Alarm Settings

See Section: 13 Alarm Settings.

Registered design. The company reserves the right to make design changes without prior notice.

18.2 Alarm Descriptions with Factory Settings

Alarm no.	Alarm text Function	Priority	Stop	Indication LED	Delay	Resetting
		0=blocked	0=In operat.	0=Off	s=seconds	M=manual
		A=A alarm	1=Stop	1=On	m=minutes	A=automatic
		B=B alarm				
1	EXTERNAL FIRE ALARM TRIPPED For the fire protection function connected to inputs Inp. 1 or Inp. 2.	A****	1*	1	3 s	M
2	INTERNAL FIRE ALARM TRIPPED The air handling unit's supply air sensor measures a temperature more than 70 °C and/or its extract air sensor measures a temperature more than 50 °C. The function must be activated manually in the ALARM SETTINGS menu.	A ****	1*	1	3 s	M
3	FROST PROTECTION BELOW ALARM LIMIT The anti-frosting monitor sensor measures a temperature lower than the preset temperature. Factory setting: 7 °C.	A ****	1*	1	3 s	M
4	R.HX.SPEED MONITOR TRIPPED No impulses from the rotation detector are registered with the heat exchanger controller. The air handling unit will be switched out only if the outdoor temperature drops below 5 °C.	A	0**	1	3 s	M
5	FROST PROTECTION SENSOR DEFECTIVE The anti-frosting monitor temperature sensor is lacking, is not connected or is faulty; an air heater for hot water is connected.	A ****	1*	1	3 s	A
6 7	SUPPLY AIR TEMP SENSOR DEFECTIVE EXTRACT AIR TEMP SENSOR DEFECTIVE The supply air/extract air temperature sensor is not connected or is faulty.	A A	1 1	1 1	3 s 3 s	A A
8	OUTDOOR AIR TEMP SENSOR DEFECTIVE The outdoor air temperature sensor is not connected or is faulty.	B	0	1	3 s	A
9	NO COMMUNICATION TO R.HX. CONTROLLER The air handling unit's control unit cannot establish correct communication with the heat exchanger controller.	A***	1	1	10 s	A
10 11	NO COMMUNICATION TO SA FREQUENCY CONV. NO COMMUNICATION TO EA FREQUENCY CONV. The air handling unit's control unit cannot establish correct communication with frequency inverter.	A *** A ***	1 1	1 1	10 s 10 s	A A
12 13	OVER CURRENT IN SA FREQUENCY CONV. OVER CURRENT IN EA FREQUENCY CONV. Current above the normal level is supplied to the motors.	A *** A ***	1 1	1 1	3 s 3 s	M M
14 15	UNDER VOLTAGE IN SA FREQUENCY CONV. UNDER VOLTAGE IN EA FREQUENCY CONV. Voltage below the normal level is supplied.	A *** A ***	1 1	1 1	3 s 3 s	M M

** Not adjustable, always stops the air handling unit.*
*** Not adjustable, stops the air handling unit if the temperature to below +5 °C.*
**** Blocked if the hand terminal does not display the main menu.*
***** Cannot be blocked.*

Alarm no.	Alarm text Function	Priority	Stop	Indication LED	Delay	Resetting
		0=blocked	0=In operat.	0=Off	s=seconds	M=manual
		A=A alarm	1=Stop	1=On	m=minutes	A=automatic
		B=B alarm				
18 19	OVER TEMPERATURE IN SA FREQUENCY CONV. OVER TEMPERATURE IN EA FREQUENCY CONV. High temperature inside the inverter.	A *** A ***	1 1	1 1	3 s 3 s	M M
20 21	NO COMMUNICATION WITH SA FREQUENCY CONV. GATEWAY NO COMMUNICATION WITH EA FREQUENCY CONV. GATEWAY The air handling unit's control unit cannot establish correct communication with the fan's communication gateway.	A*** A***	1 1	1 1	10 s 10 s	A A
22 23	SA FREQUENCY CONV. HALL SENSOR DEFECTIVE HALL SENSOR DEFECTIVE EA FREQUENCY CONV. Internal fault in hall sensor.	A*** A***	1 1	1 1	10 s 10 s	M M
24 25	EA FREQUENCY CONV. BLOCKED EA FREQUENCY CONV. BLOCKED. Motor does not rotate during start up.	A*** A***	1 1	1 1	3 s 3 s	M M
26 27	EA FREQUENCY CONV. START-UP FAILURE START-UP FAILURE EA FREQUENCY CONV. Wrong rotation during start up.	A*** A****	1 1	1 1	3 s 3 s	M M
30	EXT.EA/ROOM TEMP SENSOR DEFECTIVE Temperature sensor in extract air duct or room is not connected ("Internal bus 1" contact) or is faulty; or has been selected with communication. Applicable if the External sensor, extract air/room or Intermittent night-time heating function is selected.	A***	1	1	3 s	A
31	EXT.OUTDOOR TEMP SENSOR DEFECTIVE Temperature sensor for outdoor temperature is not connected ("Internal bus 1" contact) or is faulty; or has been selected with communication. Applicable if the External outdoor sensor function is selected.	B***	0	1	3 s	A
34	OVER CURRENT IN R.HX. CONTROLLER Current above the normal level is supplied to the rotary heat exchanger's drive motor.	A ***	1	1	3 s	M
35	UNDER VOLTAGE IN R.HX. CONTROLLER Feed voltage (25V) is supplied to the rotary heat exchanger's drive motor.	A ***	1	1	3 s	M
36	OVER VOLTAGE IN R.HX. CONTROLLER Voltage above the normal level (55 V) is supplied to the rotary heat exchanger's drive motor.	A ***	1	1	3 s	M
37	OVER TEMPERATURE IN R.HX. CONTROLLER High internal temperature (90°C for the rotary heat exchanger's controller).	A ***	1	1	3 s	M
38	R.HX. PRESSURE DROP ABOVE ALARM LIMIT The heat exchanger's defrosting function has operated for the full max period 6 times during one 24-hour period.	B ***	0	1	3 s	M

**** Blocked if the hand terminal does not display the main menu.*

Registered design. The company reserves the right to make design changes without prior notice.

Alarm no.	Alarm text Function	Priority	Stop	Indication LED	Delay	Resetting
		0=blocked	0=In operat.	0=Off	s=seconds	M=manual
		A=A alarm	1=Stop	1=On	m=minutes	A=automatic
		B=B alarm				
39	EL.HEATING COIL TRIPPED The thermal overload protection has tripped or is not connected.	A ***	1	1	3 s	M
40	EXTRACT AIR TEMP BELOW ALARM LIMIT The extract air temperature is below preset alarm limit for more than 20 minutes.	A ***	1	1	20 m	M
41	SUPPLY AIR TEMP BELOW SETPOINT The supply air temperature is below the preset set-point (for ERS and Supply air regulation) or Min SA temp (for Extract air regulation) longer than 20 minutes.	A ***	1	1	20 m	M
42	EXT. ALARM No.1 TRIPPED External alarm, connected to control unit input Inp. 1 or Inp. 2, has tripped.	A ***	1	1	Set time	M
43	EXT. ALARM No.2 TRIPPED External alarm, connected to control unit input Inp. 1 or Inp. 2, has tripped.	B ***	0	1	Set time	M
44 45	SA DUCT PRESSURE BELOW SETPOINT EA DUCT PRESSURE BELOW SETPOINT Pressure in supply/extract air duct, if pressure transducers are connected, has been more than 10% below its setpoint for more than 20 minutes.	B *** B ***	0 0	1 1	20 m 20 m	M M
46 47	SA DUCT PRESSURE ABOVE SETPOINT EA DUCT PRESSURE ABOVE SETPOINT Pressure in supply/extract air duct, if pressure transducers are connected, has been more than 10% above its setpoint for more than 20 minutes.	B *** B ***	0 0	1 1	20 m 20 m	M M
48 49	SUPPLY AIRFLOW BELOW SETPOINT EXTRACT AIRFLOW BELOW SETPOINT The supply/extract airflow has been more than 10% below its setpoint for more than 20 minutes.	B *** B ***	0 0	1 1	20 m 20 m	M M
50 51	SUPPLY AIRFLOW ABOVE SETPOINT EXTRACT AIRFLOW ABOVE SETPOINT The supply/extract airflow has been more than 10% above its setpoint for more than 20 minutes.	B *** B ***	0 0	1 1	20 m 20 m	M M
52 53	SUPPLY AIR FILTER DIRTY EXTRACT AIR FILTER DIRTY The pressure across the supply /extract air filters has exceeded the preset alarm limit for more than 10 minutes.	B *** B ***	0 0	1 1	10 m 10 m	M M
54	SERVICE PERIOD PAST ALARM LIMIT The preset service period has expired. If the alarm is RESET via the hand-held micro terminal, the alarm will be initiated again after 7 days. A new service period can be set in the ALARM SETTINGS menu.	B ***	0	1	Set time	M

**** Blocked if the hand terminal does not display the main menu.*

Alarm no.	Alarm text Function	Priority	Stop	Indication LED	Delay	Resetting
		0=blocked	0=In operat.	0=Off	s=seconds	M=manual
		A=A alarm	1=Stop	1=On	m=minutes	A=automatic
		B=B alarm				
55 56	NO COMM. SA AIR FLOW PRESSURE SENSOR NO COMM. EA AIR FLOW PRESSURE SENSOR The air handling unit's control unit cannot establish correct communication with the supply/extract air flow pressure transducer.	A *** A ***	1 1	1 1	10 s 10 s	A A
57 58	NO COMM. SA FILTER PRESSURE SENSOR NO COMM. EA FILTER PRESSURE SENSOR The air handling unit's control unit cannot establish correct communication with the supply/extract air filter pressure transducer.	B *** B ***	1 1	1 1	10 s 10 s	A A
59 60	NO COMM. SA DUCT PRESSURE SENSOR NO COMM. EA DUCT PRESSURE SENSOR The air handling unit's control unit cannot establish correct communication with the pressure transducer connected in the supply/extract air ducting. Applicable to SA /EA pressure regulation only.	A *** A ***	1 1	1 1	10 s 10 s	A A
61	NO COMM. R.HX. PRESSURE SENSOR The air handling unit's control unit cannot establish correct communication with the pressure transducer connected for the heat exchanger. Applicable to the defrosting function only.	B ***	0	1	10 s	A
62-71	NO COMMUNICATION TO I/O-MODUL NR 1–9 The air handling unit's control unit cannot establish correct communication with the connected I/O module 1–9	B ***	0	1	3 s	A
72	Correct communication can be established between the CPU circuit card and the control unit*s I/O processor.	A	1	1	30 s	A
83	SA PREFILTER FOULED The pressure across the supply air prefilter has constantly exceeded the preset alarm limit for 0 minutes.	B ***	0	1	600 s	M
84	EA PREFILTER FOULED The pressure across the extract air prefilter has constantly exceeded the preset alarm limit for 0 minutes.	B ***	0	1	600 s	M
85	COOLING OUTPUT 1 TRIPPED Broken signal is obtained at D11 for I/0-module 6. Motor protection or pressure switch may have tripped.	A	0	1	3 s	M
86	COOLING OUTPUT 2 TRIPPED Broken signal is obtained at DI2 for I/0-module 6. The motor protection or pressure switch may have tripped.	A	0	1	3 s	M
89	NO COMM. SA PREFILTER PRESS. SENSOR The air handling unit's control unit cannot establish correct communication with supply air prefilter pressure sensor.	B***	0	1	10 s	A
90	NO COMM. EA PREFILTER PRESS. SENSOR The air handling unit's control unit cannot establish correct communication with extract air prefilter pressure sensor.	B***	0	1	10 s	A

**** Blocked if the hand terminal does not display the main menu.*

Registered design. The company reserves the right to make design changes without prior notice.

Alarm no.	Alarm text Function	Priority	Stop	Indication LED	Delay	Resetting
		0=blocked	0=In operat.	0=Off	s=seconds	M=manual
		A=A alarm	1=Stop	1=On	m=minutes	A=automatic
		B=B alarm				
91	FROST PROTECTION, PREHEATING, BELOW ALARM LIMIT The sensor for the frost protection monitor, preheating, has measured a temperature lower than the preset temperature. Factory setting: 7 °C.	A	1	1	3 s	M
92	FROST PROTECTION PREHEATING SENSOR DEFECTIVE The sensor for the frosting protection monitor, preheating, is lacking, is not connected or is faulty, if an air heater for hot water is connected.	A	1	1	3 s	A
93	PREHEATING SENSOR DEFECTIVE The sensor for preheating is lacking, is not connected or is faulty, if an air heater for hot water is connected.	A	1	1	3 s	A
94	EL. AIR HEATER, PREHEATING, TRIPPED The thermal overload protection for the connected electric air preheater, has tripped or is not connected.	A***	1	1	3 s	M
95	PREHEATING BELOW SETPOINT The preheating temperature is below the preset setpoint (for ERS and Supply air control) or Min SA temp (for Extract air control) longer than 0 minutes.	A***	1	1	20 m	M
99	TIME LOCK TRIPPED Contact Swegon or their representative.	–	–	–	–****	M

**** Blocked if the hand terminal does not display the main menu.*
***** Adjustable: 0-99 months.*

19 INFORMATIVE MESSAGES

Informative messages are displayed in the hand-held micro terminal. Informative messages are displayed only when the user is viewing the Main menu.

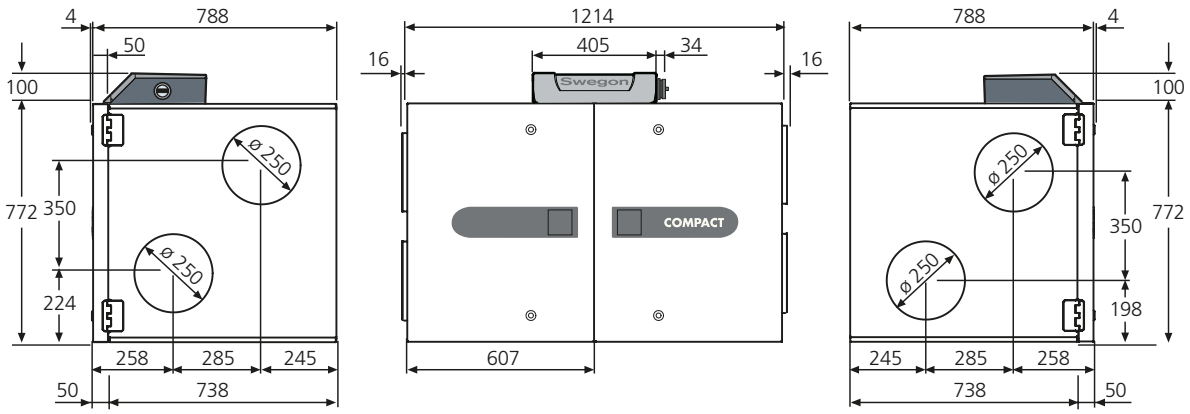
Informative messages provide particulars about necessary settings that have not been entered or unfavourable operating scenarios, for instance.

Message No.	Message Text
1	FILTER CALIBRATION NOT EXECUTED The pressure across the filters was not calibrated after the first start. Recurrent at 24-hour intervals. The message will not be received after the pressure across the filters has been calibrated.
2	H EXCH CALIBRATION NOT EXECUTED The pressure across the heat exchanger was not calibrated after the function was activated for the first time. Recurrent at 24-hour intervals. The message will not be received after the pressure across the heat exchanger has been calibrated.
3	SPARE
4	INCORRECT DIP SWITCH SETTINGS DIL switches on the control circuit card are set in a forbidden combination.
5	SPARE
6	E-MAIL ERROR Error when e-mail is being delivered. The message will be displayed after ten attempts.
7	PREFILTER CAL NOT EXECUTED The pressure across the prefilters was not calibrated after the first start. Recurrent at 24-hour intervals. The message will not be received after the pressure across the prefilters has been calibrated.

Registered design. The company reserves the right to make design changes without prior notice.

20 TECHNICAL DATA

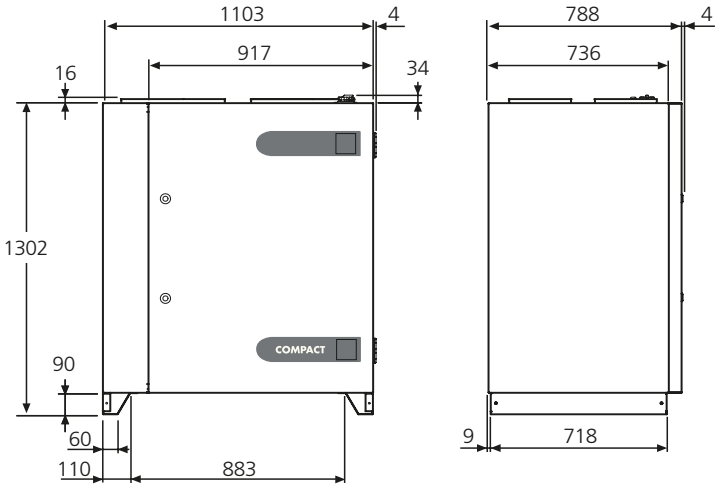
20.1 Dimensions, COMPACT Unit one-piece unit

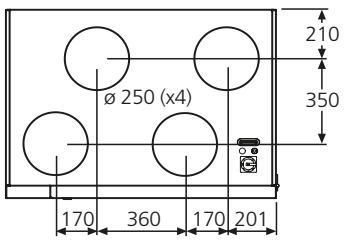


Weight 160 kg.

A clear space of 800 mm must be provided in front of the unit for opening the inspection doors and at least 200 mm must be provided above the unit for opening the junction hood.

20.2 Dimensions, COMPACT Top One-piece Unit





Weight 200 kg.

A clear space of 1,000 mm should be provided in front of the unit for opening the inspection doors.

20.3 Electrical Equipment Cubicle

The electrical equipment cubicle contains two units: the control unit and the power unit.

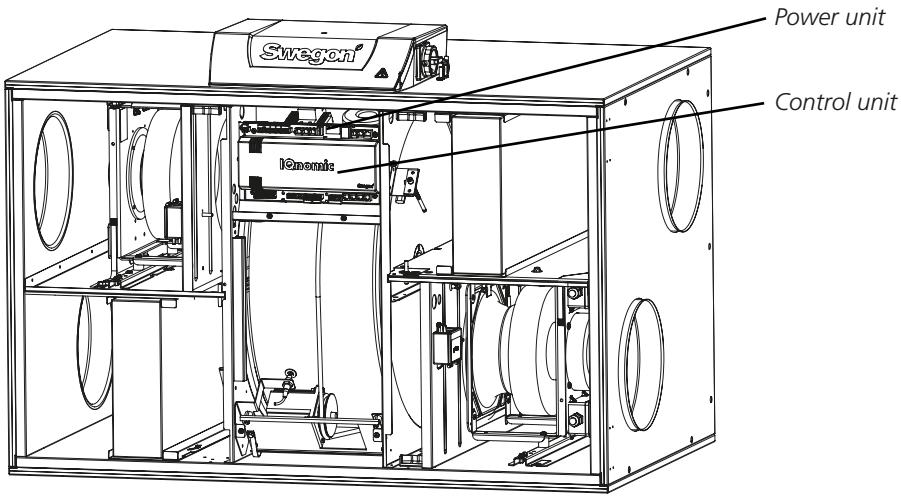
On the COMPACT Unit, the control unit is positioned behind the cover plate of the heat exchanger. This must be dismantled to gain access.

The power unit is positioned behind the control unit.

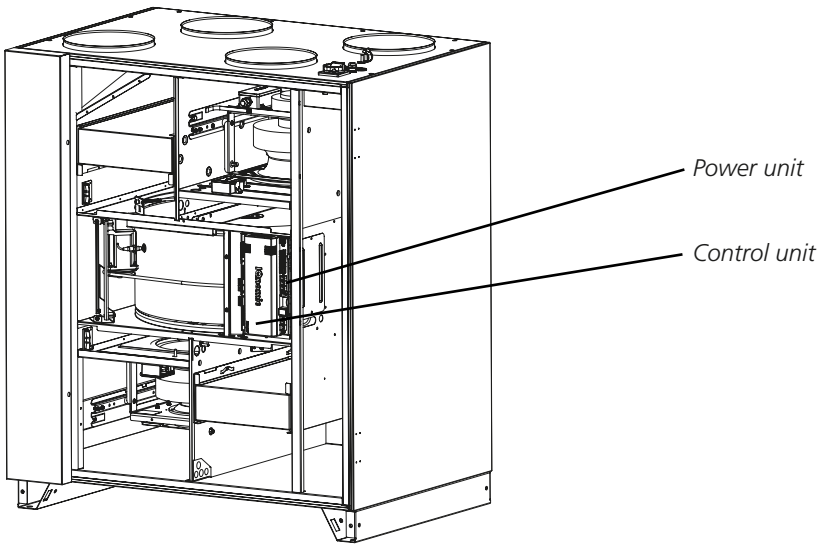
The power unit in the COMPACT Unit is accessible after removing the junction hood from the top of the air handling unit.

On the COMPACT Top unit, remove the cover plate by the cable entries in the air handling unit's extract air duct. See the illustration.

COMPACT Unit



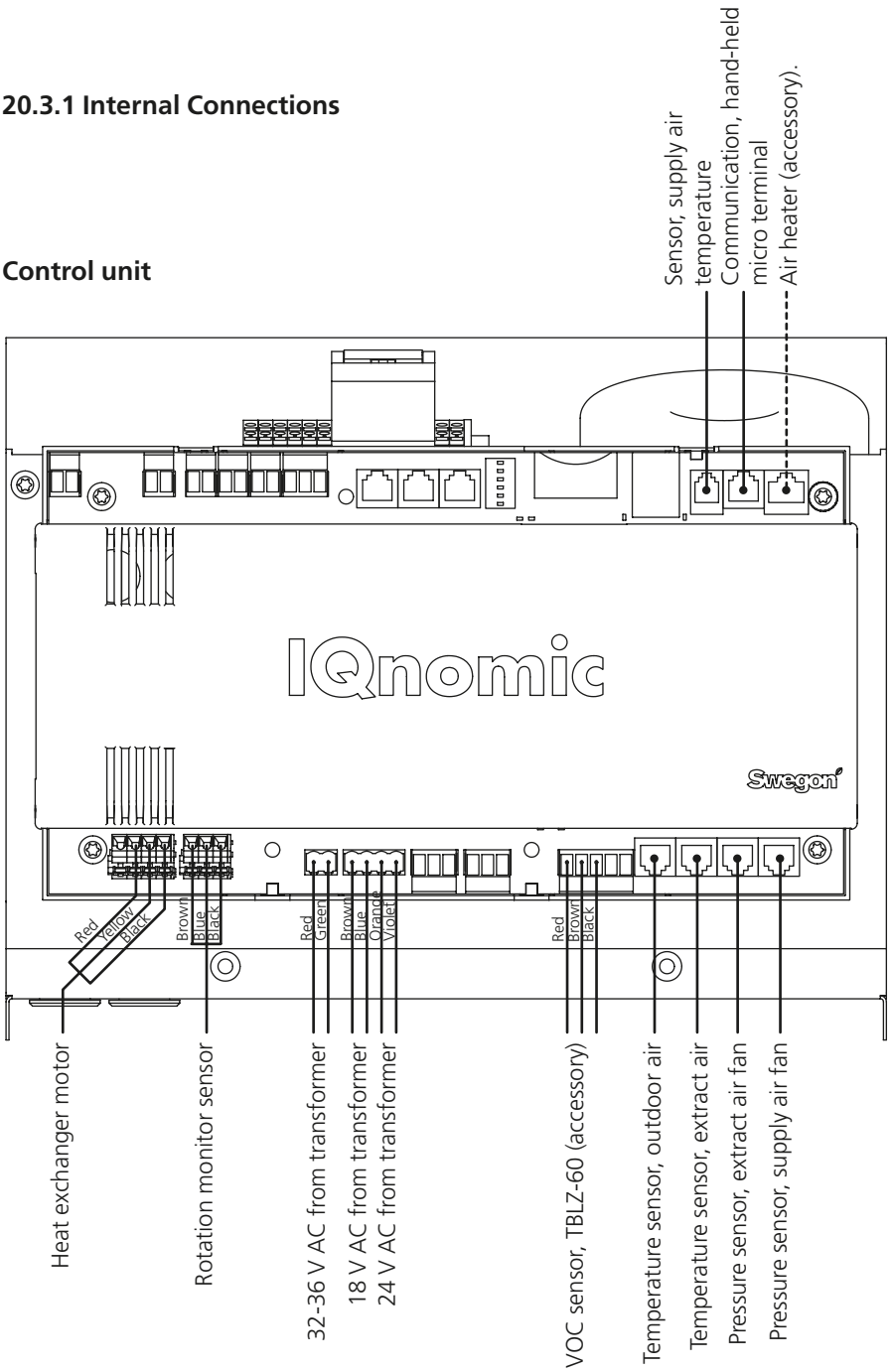
COMPACT Top



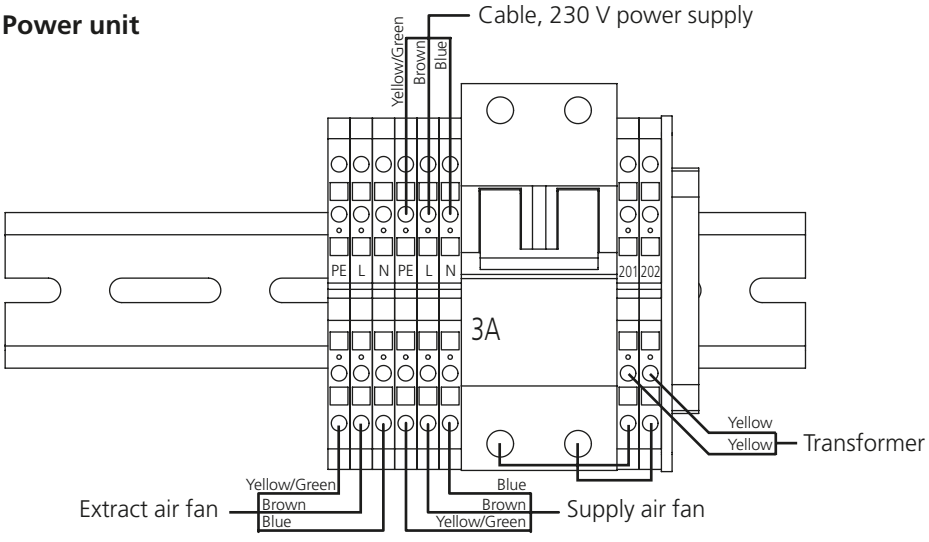
Registered design. The company reserves the right to make design changes without prior notice.

20.3.1 Internal Connections

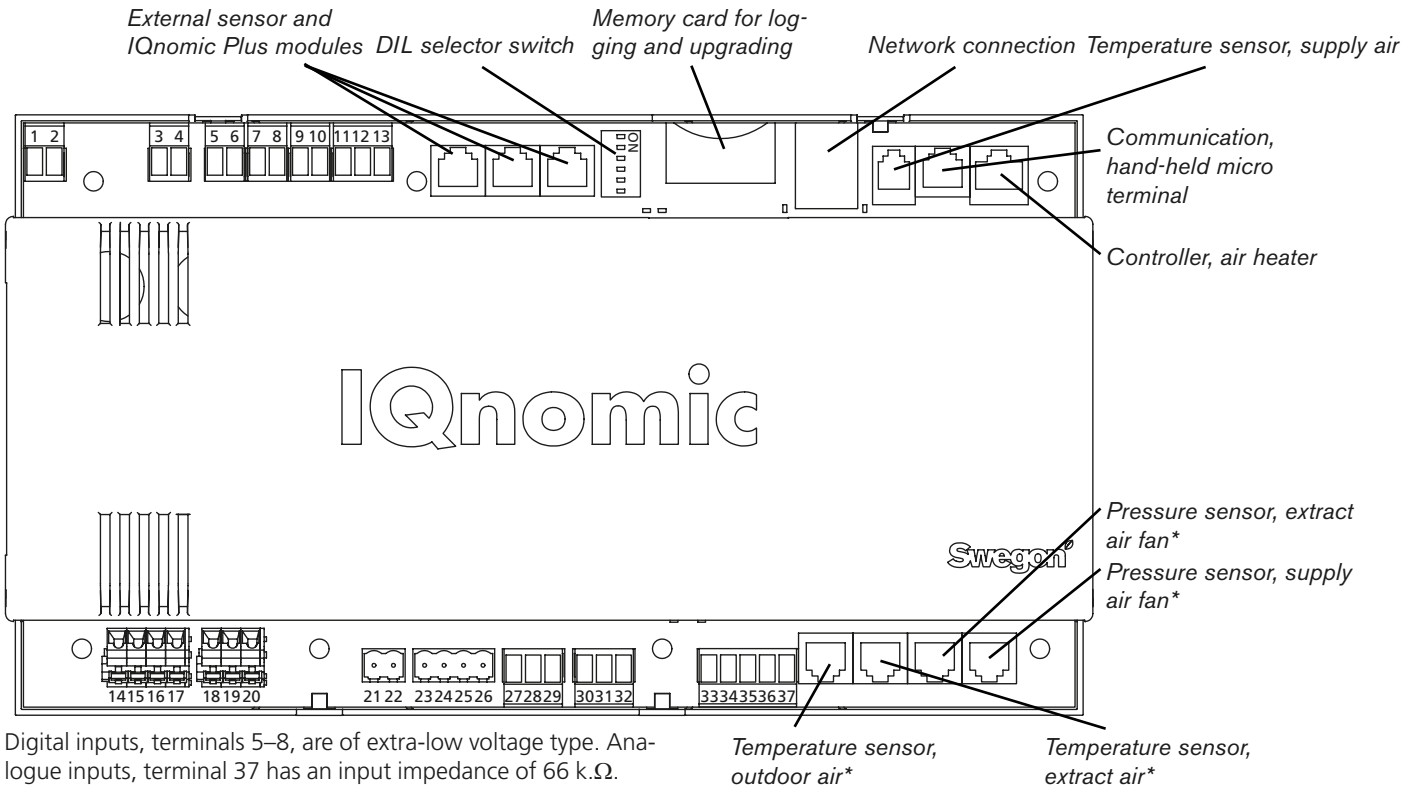
Control unit



Power unit



20.3.2 Connection to Terminal Blocks



Digital inputs, terminals 5–8, are of extra-low voltage type. Analogue inputs, terminal 37 has an input impedance of 66 k.Ω.

**COMPACT Unit: The designations apply to the right-hand version. In the left-hand version, the sensors change function and designation (the components are named according to whether they are for supply air or extract air).*

Terminal	Function	Remarks
1,2	Output 1	Select function individually. Independent contact, max. 5 A/AC1, 1A/AC3, 250 V AC.
3,4	Output 2	Select function individually. Independent contact, max. 5 A/AC1, 1A/AC3, 250 V AC.
5,6	Input 1	Select function individually.
7,8	Input 2	Select function individually.
9,10	Control voltage	Control voltage: 24 V AC, max. permissible load : 28 VA. 9 (G), 10 (G0).
11,12,13	Connections for EIA 485	11 communication connection A/RT+, 12 communication connection B/RT–, 13 = GND/COM.
14,15,16, 17	Heat exchanger motor	14 Earth, 15 Red, 16 Yellow, 17 Black.
18,19,20	Rotation monitor sensor	18 Brown, 19 Blue, 20 Black.
21,22	Supply voltage, H EXCH control	36 V AC, in
23,24	Supply voltage, control unit	18 V AC, in
25,26	Supply voltage, outputs 24 V	24 V AC, in
27,28,29	Damper actuator, change-over damper (Applies to COMPACT Heat only)	27 (G0) Black 24 V AC(-), 28 (G) Red 24 V AC(+), 29 (NO) White 24 V AC out if active.
30,31,32	Damper actuator, air recirculation damper	30 (G0) Black 24 V AC(-), 31 (G) Red 24 V AC(+), 32 (NO) White 24 V AC out if active.
33	Output, fixed power supply: 12 V DC out	12 V DC to GND. Max permissible load: 500 mA
34	PWM input for Clean Air Control	VOC sensor
35	Measuring zero, GND	
36	Output, fixed power supply: 10 V DC out	10 V DC to GND Max. permissible load: 20 mA.
37	Input, 0–10 V DC, for demand-controlled control of the airflow	Air quality sensor

DIL selector switches:

COMPACT Unit, right-hand version: DIL switch 4 must be set to the ON position, the other switches must be set to the OFF position.
COMPACT Unit, left-hand version: DIL switches 1 and 4 must be set to the ON position, the other switches must be set to the OFF position.
COMPACT Top: DIL switch 3 must be set to the ON position, the other switches must be set to the OFF position.

Registered design. The company reserves the right to make design changes without prior notice.

20.4 Electrical Data

20.4.1 Air Handling Unit

MIN. POWER SUPPLY
1-phase, 3-wire, 230 V -10/+15%, 50 Hz, 10 AT

20.4.2 Fans

RATED DATA PER FAN

Size 02: 1 x 230 V, 50/60 Hz, 0.5 kW (0.28 kW)*
Size 03: 1 x 230 V, 50/60 Hz, 0.5 kW (0.43 kW)*

**) The motor controls limit the output power to the value specified.*

20.4.3 Electrical equipment cubicle

One 2-pole 3A Automatic circuit breaker for 230V control current

20.4.4 Heat Exchanger Motor

Step motor, 3-phase, 5.8 A (2A)*, 62 V max 90 V.
**) The motor controls limit the output power to the value specified.*

20.4.5 Control Inaccuracy

Temperature ± 1°C.
Airflow ± 5%.

21 ANNEXES

21.1 Compliancy Declaration

We, Swegon AB

Box 300
S-535 23 Kvänum

declare under our own sole responsibility that

Air handling units with the following designation:
COMPACT Air, COMPACT Heat, COMPACT Unit, COMPACT Top
and any accessories to the respective designation covered by these directives

comply with the Machinery Directive 2006/42/EC

and also to the following directives

2004/108/EC EMC, (Electromagnetic Compatibility)
2006/95/EC LVD, (the Low Voltage Directive)

The following harmonised standards have been applied:

EN ISO 12100-1, -2 (Safety of machinery, general principles for design)
EN ISO 13857:2008 (Safety distances)
EN ISO 14121-1:2007 (Risk assessment)
EN 60204-1 (Electrical equipment of machines)
EN 61000-6-2, -3 (Electromagnetic compatibility)

The following other standards and specifications have been applied:

EN 1886:2007 (Ventilation for buildings, air handling units)
EN 13053:2006 (Ventilation for buildings, air handling)

Person authorised to compile the technical documentation:

Dan Örtengren
Box 300
535 23 Kvänum

This declaration is applicable only if the air handling unit(s) has/have been installed according to Swegon's instructions and provided that the air handling unit(s) has/have not been modified in any way.

Kvänum, 31/05/2010

Thord Gustafsson, Quality and Environmental Manager, Swegon AB

Registered design. The company reserves the right to make design changes without prior notice.

21.2 Commissioning Record

Company

Our reference

Client	Date	SO No.
Plant	**Project/Air handling unit**	**Subject No.**
Plant address	**Type/Size**	**Program version:**

Filter calibration done ☐

Time switch clock, current time ☐

Other controls _____

Settings – time channels (scheduling), time switch clock

Channel	Operating mode	Times	Week day
1	Low ☐ High ☐	: – :	:
2	Low ☐ High ☐	: – :	:
3	Low ☐ High ☐	: – :	:
4	Low ☐ High ☐	: – :	:
5	Low ☐ High ☐	: – :	:
6	Low ☐ High ☐	: – :	:
7	Low ☐ High ☐	: – :	:
8	Low ☐ High ☐	: – :	:

Settings – year channel (scheduling), time switch clock

Channel	Operating mode	Times	Period
1	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
2	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
3	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
4	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
5	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
6	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
7	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
8	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –

Function	Factory-preset value	Adjusted value
Temperature		
Temp. Reg. (Control) function	[X] ERS 1 [ ] ERS 2 [ ] SA [ ] EA	[ ] ERS 1 [ ] ERS 2 [ ] SA [ ] EA
Difference SA/EA (°C)	3,0	
Step	2	
Breakpoint (°C)	22,0	
X1	15,0	
Y1	20.0	
X2	20.0	
Y2	18.0	
X3	22.0	
Y3	14.0	
Setpoint (°C)	21.5 21.5	
Min. SA temp. (°C)	15.0	
Min. SA temp. (°C)	28.0	
Outdoor temp. compensation	[X] Inactive [ ] Active	[ ] Inactive [ ] Active
Temperature		
Winter comp. Y1 (°C)	3.0	
End point, winter X1 (°C)	-20.0	
Starting point, winter X2 (°C)	10.0	
Startpoint summer X3 (°C)	25.0	
Endpoint summer X4 (°C)	40.0	
Summer comp. Y2 (°C)	2.0	
Summer night cooling	[X] Inactive [ ] Active	[ ] Inactive [ ] Active
EA temp. start (°C)	22.0	
EA temp. stop (°C)	16.0	
Outdoor air temp. stop (°C)	10.0	
SA Setpoint (°C)	10.0	
In-oper. time start (hh:mm)	23:00	
In-oper. stop (hh:mm)	06:00	
Intermittent night-time heating	[X] Inactive [ ] Active	[ ] Inactive [ ] Active
EA/Room start (°C)	16.0	
EA/Room stop (°C)	18.0	
SA Night setpoint (°C)	28.0	
SA flow (m²/s / Pa)	*1)*	
SA flow (m²/s / Pa)	0.0	
Damper output	=0	
Morning BOOST		
Time (hh:mm)	00:00	
Damper	[X] Inactive [ ] Active	[ ] Inactive [ ] Active
EA fan	[X] Inactive [ ] Active	[ ] Inactive [ ] Active
EA/Room temp	22.0°C	
EA min	15.0°C	
SA max	28.0°C	
External sensor		
External EA/Room	[X] Inactive [ ] IQnom [ ] Comm.	[ ] Inactive [ ] IQnom [ ] Comm.
External outdoor	[X] Inactive [ ] IQnom [ ] Comm.	[ ] Inactive [ ] IQnom [ ] Comm.

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Function		Factory-preset value				Adjusted value			
Flow/pressure									
Fan Regulation, SA*		[X] Flow	[ ] Pressure	[ ] Need	[ ] Slave	[ ] Flow	[ ] Pressure	[ ] Need	[ ] Slave
Fan Regulation, EA*		[X] Flow	[ ] Pressure	[ ] Need	[ ] Slave	[ ] Flow	[ ] Pressure	[ ] Need	[ ] Slave
Flow, low speed*	SA	*1)*			*1)*				
	EA	*1)*			*1)*				
Flow, high speed*	SA	*2)*			*2)*				
	EA	*2)*			*2)*				
Flow, max speed	SA	*4)*		*3)*	*4)*				
	EA	*4)*		*3)*	*4)*				
Flow, min. speed	SA			*5)*					
	EA			*5)*					
Pressure, low speed*	SA (Pa)		100						
	EA (Pa)		100						
Pressure, high speed*	SA (Pa)		200						
	EA (Pa)		200						
Max. fan speed*	SA (%)		100%						
	EA (%)		100%						
Pressure, max speed *	SA (Pa)		400 *6)*						
	EA (Pa)		400 *6)*						
Demand-contr., low speed	SA (%)			25					
	EA (%)			25					
Demand-contr., high speed	SA (%)			50					
	EA (%)			50					
Clean Air Control		[X] Inactive	[ ] Active			[ ] Inactive	[ ] Active		
Outdoor temp. compen.		[X] Inactive	[ ] Active			[ ] Inactive	[ ] Active		
Flow									
Winter compens. Y1 (%)		30							
End point, winter X1 (°C)		-20							
Start. point, winter X2 (°C)		10							
Down-speed regulation									
Function		[ ] Inactive	[X] SA	[ ] SA + EA		[ ] Inactive	[ ] SA	[ ] SA + EA	
Neutral zone (°C)		0,0							
In-operation									
Time switch clock function		[X] 1. Low – high		[ ] 2. Stop – low – high		[ ] 1. Low – high		[ ] 2. Stop - low - high	
Slave control									
C-Factor		1,0							
Filter function		[ ] Inact.	[ ] SA	[ ] EA	[X] SA+EA	[ ] Inact.	[ ] SA	[ ] EA	[ ] SA+EA
Prefilter		[X] Inact.	[ ] SA	[ ] EA	[ ] SA+EA	[ ] Inact.	[ ] SA	[ ] EA	[ ] SA+EA
Extended operation									
External low speed (h:mm)		0:00							
External low speed (h:mm)		0:00							

* Not used for Clean Air Control

Function	Factory-preset value	Adjusted value
Summer/winter time	☐ Inactive ☒ Active	☐ Inactive ☐ Active
Heating		
Heat exchanger		
Defrosting	☒ Inactive ☐ Active	☐ Inactive ☐ Active
Reheating		
Exercising	☒ Inact. ☐ Pump ☐ Valve ☐ P+V	☐ Inact. ☐ Pump ☐ Valve ☐ P+V
Exercise period	3 Min.	
Interval	24 hrs.	
"Heating BOOST"		
Function, Off/On	☒ Inactive ☐ Active	☐ Inactive ☐ Active
Start limit, SA temp. (°C)	3,0	
Cooling	☒ Inactive ☐ Auto operation	☐ Inactive ☐ Auto operation
Cooling unit controls	☐ Stepless 0-10 V ☐ Stepless 10-0 V ☒ On/off 1-step ☐ On/off 2-step ☐ On/off 3-step binary mode	☐ Stepless 0-10 V ☐ Stepless 10-0 V ☐ On/off 1-step ☐ On/off 2-step ☐ On/off 3-step binary mode
Exercising — Cooling relay 1	☒ Inactive ☐ Pump ☐ P+V ☐ Valve	☐ Inactive ☐ Pump ☐ P+V ☐ Valve
Cooling relay 2	☒ Inactive ☐ Pump ☐ P+V ☐ Valve	☐ Inactive ☐ Pump ☐ P+V ☐ Valve
Exercise period	3 Min.	
Interval	24 hrs.	
Control reaction speed		
Step duration (s)	300	
Outdoor temp. limit — Step 1 (°C)	3,0	
Step 2 (°C)	5,0	
Step 3 (°C)	7,0	
Reset time (s)	480	
Cool. min. SA flow (m³s)	0,1	
Cool. min. EA flow (m³s)	0,1	
Neutral zone (°C)	2,0	
"Cooling BOOST"	☒ Inactive ☐ Comf. ☐ Econ. ☐ Sequ. ☐ Comf.+econ. ☐ Econ.+sequ.	☐ Inactive ☐ Comf. ☐ Econ. ☐ Sequ. ☐ Comf.+econ. ☐ Econ.+sequ.
Start limit SA temp. (°C)	3,0	
Inputs/Outputs		
Relay 1	A Alarm output 4)	
Relay 2	B Alarm output 4)	
Input 1	External low speed 5)	
Input 2	External high speed 5)	
"IQnomic Plus"		
I/O Module No. 3 — Ext. monitoring	☒ Inactive ☐ Active	☐ Inactive ☐ Active
I/O Module No. 6 — Ext. cooling	☒ Inactive ☐ Active	☐ Inactive ☐ Active
I/O Module No. 9 — Preheating	☒ Inactive ☐ Active	☐ Inactive ☐ Active

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Function	Factory-preset value	Adjusted value
Alarm setting		
Fire alarm function		
Internal fire alarms	[X] Inactive [ ] Active	[ ] Inactive [ ] Active
External fire alarm Alarm resetting	[X] Man. [ ] Auto	[ ] Man. [ ] Auto
Fan oper. in the event of a fire	[X] Inactive [ ] SA [ ] EA [ ] SA+EA	[ ] Inactive [ ] SA [ ] EA [ ] SA+EA
SA fan speed in event of fire (%)	100	
EA fan speed in event of fire (%)	100	
External alarms		
Time delay Alarm 1 (s)	10	
Alarm on closure, Alarm 1	1	
Alarm reset	[X] Man. [ ] Auto	[ ] Man. [ ] Auto
Time delay Alarm 2 (s)	10	
Alarm on closure, Alarm 2	1	
Alarm reset	[X] Man. [ ] Auto	[ ] Man. [ ] Auto
Alarm limit temperature		
Deviation, SA setpoint	5,0	
Min. EA temperature	15,0	
Filter function		
Filter alarm limit		
SA (%/Pa)	10/100	
EA (%/Pa)	10/100	
H EXCH defrosting		
Alarm limit (Pa)	50	
Service period		
Alarm limit (month)	12	
Alarm priority *See the following pages*	-	
Hand-held micro terminal settings		
Language	English	
Flow unit	[ ] l/s [X] m^3/s [ ] m^3/h	[ ] l/s [ ] m^3/s [ ] m^3/h
Min./max. setting		
Setpoint, SA/EA (°C)	15,0/40,0	
Min. limit, SA (°C)	13,0/18,0	
Max. limit, SA (°C)	25,0/45,0	
Break point, ERS Regulation (°C)	15,0/23,0	
SA/EA Difference (°C)	1,0/5,0	
Initial setting	–	
Communication		
EIA-485		
Protocol	Modbus RTU	
Address	1	
	PLA (Exoline) 1	
	ELA (Exoline) 1	
Speed	9600	
Parity	None	
Stop bit	1	

Function	Factory-preset value	Adjusted value
Ethernet		
Mac Id	Individual	
DHCP server	Inactive	
IP address	10.200.1.1	
Port no.	80	
Net mask	255.0.0.0	
GateWay	000.000.000.000	
DNS server		
No. 1	000.000.000.000	
No. 2	000.000.000.000	
Modbus TCP		
IP	000.000.000.000	
Port no.	502	
Net mask	000.000.000.000	
BACNet IP		
Function	Inactive	
Device ID	0000000	
Port nr.	47808	

The values by turns refer to sizes 02, 03.
1) Applies to COMPACT Heat only
2) Only in combination with Cooling BOOST. 0.2 m^3/s, 0.3 m^3/s.
3) Only in combination with Demand control. 0.08 m^3/s, 0.08 m^3/s.
4) Possible options: Control of outdoor air/exhaust air damper, in-operation indication, low speed operation indication, indication or high speed operation, group alarm A, group alarm B, control of external heating, control of external cooling.
5) Possible options: External stop, external low speed operation, external high speed operation, external alarm 1, external alarm 2, external reset, external heating, external fire alarm.
6) Only in combination with forcing.

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Alarm No.:	Function	Factory preset value			Adjusted value		
		Priority	Indication	Effect	Priority	Indication	Effect
		0=blocked	LED	0=Operat.	0=blockedt	LED	0=Operat.
		A=A alarm	0=Off	1=Stop	A=A alarm	0=Off	1=Stop
		B=B alarm	1=On		B=B alarm	1=On	
1	External fire alarm tripped	A****	1	1*			
2	Internal fire alarm tripped	A****	1	1*			
3	Frost protection below alarm limit	A****	1	1*			
4	R.hx. speed monitor tripped	A	1	0**			
5	Frost protection sensor defective	A****	1	1*			
6	Supply air temp sensor defective	A	1	1			
7	Extract air temp sensor defective	A	1	1			
8	Outdoor air temp sensor defective	B	1	0			
9	No communication to r.hx. controller	A ***	1	1			
10	No communication to SA frequency conv.	A ***	1	1			
11	No communication to EA frequency conv.	A ***	1	1			
12	Over current in SA frequency conv.	A ***	1	1			
13	Over current in EA frequency conv.	A ***	1	1			
14	Under voltage in SA frequency conv.	A ***	1	1			
15	Under voltage in EA frequency conv.	A ***	1	1			
18	Excess temperature in SA frequency inverter	A***	1	1			
19	Excess temperature in EA frequency inverter	A***	1	1			
20	No communication SA frequency range gateway	A***	1	1			
21	No communication EA frequency range gateway	A***	1	1			
22	Hall sensor defective SA frequency range	A***	1	1			
23	Hall sensor defective EA frequency range	A***	1	1			
24	SA frequency range blocked	A***	1	1			
25	EA frequency range blocked	A***	1	1			
26	Start-up failure SA frequency range	A***	1	1			
27	Over voltage in EA-2 frequency conv.	A ***	1	1			
30	Ext. EA/room temp sensor defective	A ***	1	1			
31	Ext. outdoor temp sensor defective	B ***	1	0			
34	Over current in r.hx. controller	A ***	1	1			
35	Under voltage in r.hx. controller	A ***	1	1			
36	Over voltage in r.hx. controller	A ***	1	1			
37	Over temperature in r.hx. controller	A ***	1	1			
38	R.hx pressure drop above alarm limit	B ***	1	0			
39	El.heating coil tripped	A ***	1	1			
40	Extract air temp below alarm limit	A ***	1	1			
41	Supply air temp below setpoint	A ***	1	1			
42	Ext.alarm No.1 tripped	A***	1	1			

Alarm No.:	Function	Factory preset value			Adjusted value		
		Priority	Indication	Effect	Priority	Indication	Effect
		0=blocked	LED	0=Operat.	0=blockedt	LED	0=Operat.
		A=A alarm	0=Off	1=Stop	A=A alarm	0=Off	1=Stop
		B=B alarm	1=On		B=B alarm	1=On	
43	Ext. alarm No.2 tripped	B ***	1	0			
44	SA duct pressure below setpoint	B ***	1	0			
45	EA duct pressure below setpoint	B ***	1	0			
46	SA duct pressure above setpoint	B ***	1	0			
47	EA duct pressure above setpoint	B ***	1	0			
48	Supply airflow below setpoint	B ***	1	0			
49	Extract airflow below setpoint	B ***	1	0			
50	Supply airflow above setpoint	B ***	1	0			
51	Extract airflow above setpoint	B ***	1	0			
52	Supply air filter dirty	B ***	1	0			
53	Extract air filter dirty	B ***	1	0			
54	Service period past alarm limit	B ***	1	0			
55	No comm. SA air flow pressure sensor	A ***	1	1			
56	No comm. EA air flow pressure sensor	A ***	1	1			
57	No comm. SA filter pressure sensor	B ***	1	0			
58	No comm. EA filter pressure sensor	B ***	1	0			
59	No comm. SA duct pressure sensor	A ***	1	1			
60	No comm. EA duct pressure sensor	A ***	1	1			
61	No comm. r.hx. pressure sensor	B ***	1	0			
62	No communication to I/O-module No:0	B ***	1	0			
63	No communication to I/O-module No:1	B ***	1	0			
64	No communication to I/O-module No:2	B ***	1	0			
65	No communication to I/O-module No:3	B ***	1	0			
66	No communication to I/O-module No:4	B ***	1	0			
67	No communication to I/O-module No:5	B ***	1	0			
68	No communication to I/O-module No:6	B ***	1	0			
69	No communication to I/O-module No:7	B ***	1	0			
70	No communication to I/O-module No:8	B ***	1	0			
71	No communication to I/O-module No:9	B ***	1	0			
72	No communication to main controller I/O	A	1	1			
83	Supply air, prefilter fouled.	B***	1	0			
84	Exhaust air prefilter, fouled	B***	1	0			
85	Cooling Output 1 tripped	A	1	0			
86	Cooling Output 2 tripped	A	1	0			
89	No comm. with press. sensor by SA prefilter	B***	1	0			
90	No comm. with press. sensor by EA prefilter	B***	1	0			
91	Frost prot. for preheating, below alarm limit	A	1	1			

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Alarm No.:	Function	Factory preset value			Adjusted value		
		Priority	**Indication**	**Effect**	**Priority**	**Indication**	**Effect**
		0=blocked	**LED**	0=Operat.	0=blockedt	**LED**	0=Operat.
		A=A alarm	0=Off	1=Stop	A=A alarm	0=Off	1=Stop
		B=B alarm	1=On		B=B alarm	1=On	
92	Frost prot. for preheating sensor, faulty	A	1	1			
93	Preheating sensor faulty	A	1	1			
94	Electric air heater for preheating, tripped	A***	1	1			
95	Preheating below setpoint	A***	1	1			
99	Time lock tripped	A	1	1			

** Not adjustable, always stops the air handling unit*
*** Not adjustable, stops the air handling unit at temperature below +5 °C*
**** Blocked if the hand terminal does not display the main menu.*
***** Cannot be blocked.*

Adjustments carried out by:

Date _____

Company _____

Name _____

All documentation is available in digital form and can be downloaded from www.swegon.com

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